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THE  
ILLUSTRATED RECORD  
AND  
DESCRIPTIVE CATALOGUE  
OF THE  
DUBLIN INTERNATIONAL EXHIBITION OF 1865.

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Dublin International Exhibition  
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1865.

COMPILED AND EDITED BY  
HENRY PARKINSON, BARRISTER-AT-LAW,  
*SECRETARY AND COMPTROLLER;*  
AND  
PETER LUND SIMMONDS, F.S.S.,  
*COLONIAL SUPERINTENDENT;*

AIDED BY  
NUMEROUS CONTRIBUTIONS FROM THE SEVERAL HEADS OF DEPARTMENTS  
AND OTHER EXPERIENCED WRITERS ON SPECIAL SUBJECTS.

With Two Hundred and Fifty Illustrations on Wood, Stone, and Steel; Photographs, &c.

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## P R E F A C E.

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THE importance of the publication of some official work of reference respecting an International Exhibition is well understood by all who have taken part in any of these great undertakings, whether as exhibitors or as officials. Usually it takes the form of some Governmental Report presented to Parliament, embracing a *résumé* of the financial results of the Exhibition, and what the Executive have been able to accomplish; and there is also issued a large volume of Jury Reports, entering very fully into the details of the noteworthy objects shown, and recording the exhibitors rewarded. The Dublin Exhibition of 1865, however, partaking more of a private than a Governmental character, such an official report, at the close, was scarcely deemed necessary. With the exception of the usual shilling Catalogue of objects exhibited, and a small Pamphlet containing the Jury Awards and the Reports which were made by the Juries for some few Sections, there was nothing officially issued describing the rise and progress of the Exhibition, and its results as compared with those of previous undertakings of the kind.

Although not disposed to incur the labour or risk of publishing a Descriptive Record themselves, the Executive Committee favourably entertained the proposition of Mr. SIMMONDS to issue such a work, and accorded it their support. The present volume, therefore, although not emanating directly from the Executive Committee, partakes of a semi-official character, being published under their immediate sanction and supervision; and all official documents and correspondence have been freely placed at the disposal of the Editors, in order to render the book complete and trustworthy; still, any opinions advanced or statements made, must be looked upon entirely as those of the Editors.

No pains or expense have been spared to render the work a creditable and interesting Record of the second Great Industrial Exhibition in Ireland, and it will compare, it is believed, favourably with any preceding work of the kind. Especial attention and extended space have been given, in its pages, to the description and details

of Irish industries, in order to mark the progress which has been made in the last ten years, so that on the occasion of any future International Exhibition being held in Ireland a retrospective comparison may the more easily be made.

The paper, printing, binding, and some of the illustrations on steel and stone are creditable proofs of what can be done in Ireland.

From the size to which the volume has extended, and from having to wait for special reports from various home and foreign contributors, the publication of the work has been delayed longer than was originally anticipated; yet it was thought better to issue it in as complete a form as possible, even at the expense of a little delay.

The profuseness of illustrations and the general appearance of the work are evidences that reputation rather than profit has been aimed at, and it is to be hoped that it will be found a useful work of future reference.

Thanks are due to a great many gentlemen who have contributed interesting reports and papers to the work; and of these special mention may be made of Mr. HERCULES MACDONNELL, Mr. ANTONIO BRADY, Sir J. J. COGHILL, Bart., Mr. E. H. WADGE, F.G.S., Mr. G. A. WALLER, Mr. JOHN ROBINSON of Natal, and Mr. J. STURGEON.

Rather full reports have been given of the principal British Colonies that went to the expense and trouble of forwarding large collections to the Exhibition, more especially of Canada, Natal, Nova Scotia, and Victoria. Mr. W. P. JERVIS, Secretary to the Italian Commission, has been kind enough to make many valuable additions and corrections to the Official Italian Catalogue, and to contribute an original essay on the Thermal Springs of Central Italy, with chemical analyses of their waters.

Many of the illustrations of the Courts and objects shown, have been procured from the Proprietors of the London *Illustrated News*, *Illustrated Times*, *Builder*, and other publications. To the polite attention of Dr. FORBES WATSON, of the India Museum, the Editors are indebted for the two Photographs which illustrate the Indian Department.

THE EDITORS.

November, 1866.

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# ERRATA.

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- 75 In Summary of Colonial Goods, 2nd col., add in Tasmania, the figure 2.
- 156 No. 11, Canada, for "Petrie, Strowger, & Co." read "Petrie & Stronger."
- 170 No. 62, Victoria, for "Officer" read "Officer."
- 173 1st col., line 18 from top, for "65" read "43A."
- 237 2nd col., line 11 from bottom, for "235" read "335. Webb, H."
- 248 No. 352, for "Morison" read "Morrison."
- 249 In Jury Report, for "S. A. Chappell, 50 New Bond st." read "45."
- 252 1st col., line 9 from top, for "E. X. Wehrle" read "F. X. Wehrle."
- 255 2nd col., No. 405, last line, for "in scarfs, &c.," read "of scarfs."
- 269 1st col., fifth line from bottom, for "varnish of gloss" read "coating of gelatine."
- 271 In heading of Section, for "Fabrcis" read "Fabrica."
- 274 1st col., No. 552, for "Dunnicliffe" read "Dunnicliff."  
2nd col., Malta, No. 3, for "Munero" read "Munero."
- 275 Section XX., for "the Jurors of Class XX." read "of Section XX."
- 276 Belgium, No. 106, for "Watrigant, A." read "Watrigant, T. A."
- 292 Rome, 19, for "Barberi" read "Barbieri."
- 301 No. 769, for "Rowal" read "Rowan."
- 334 No. 51, for "Mrs. Osen" read "Mrs. Osten."

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- 335 In list of Canadian woods, 2nd col., No. 15, for "red birch" read "red beech;" and for "*Fagus pungina*" read "*P. ferruginea*."
- No. 17 & 18, for "white oak" and "red oak" read "white and red ash."
- No. 19, for "*Corus*" read "*Cornus*."
- No. 24, for "*Prunus Pennsylvanica*" read "*P. Pennsylvanica*."
- 361 No. 21, third line from bottom, for "three pairs of ivory tusks," read "three fine ivory tusks."
- 393 In Table of Foreign Exhibitors—Italy—the No. of medals should be 99, and hon. mentions 64. Japan should have 1 hon. mention. This will alter the total of medals to 439, and of hon. mentions to 220.
- 394 No. 19, for "Spowasser" read "Stowasser."
- 396 No. 78, for "Kail, Halot, & Co." read "Cail, Halot, & Co."
- 397 No. 106, for "Watrigan" read "Watrigant."
- 411 No. 8, for "Novi, Chas." read "Novi, Cheval."
- 430 1st line of 2nd col., for "crysalis" read "chrysalis."
- 511 No. 320, for "F. House" read "F. Houzè."
- 512 No. 443, for "Captain Ancarcrona" read "Ankar-krona."
- 520 No. 156, for "J. W. Barre" read "W. J. Barre."
- 525 No. 139, for "Sedgefield, R." read "W. R."
- 529 2nd col., under Victoria, last line of paragraph, for "129 C. W. Liger" read "127 C. W. Ligar."
- 529 France, 159, for Lyte, "F. M." read "F. W."
- 530 No. 40, for Manchester Photographic "Company" read "Society."

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THE RECORD  
AND  
DESCRIPTIVE CATALOGUE  
OF THE  
DUBLIN EXHIBITION OF 1865.

---

INTRODUCTION.

THE history of public Exhibitions has been frequently written of late years, and the priority of their origin much discussed. It is at least evident that the French are not entitled to the credit of originating national exhibitions of industry and art, the first French Exhibition having been held at Paris in 1798, previous to which much had been done in that direction in the capitals both of England and Ireland. In England, the Society of Arts, Manufactures, and Commerce claims the credit of originating national exhibitions. In 1756—about the period when the Royal Academy first began its fine art exhibitions—the Society of Arts offered prizes for improvements in the manufacture of tapestry, carpets, porcelain, and other things, and exhibited the articles sent for competition. It offered prizes, also, for improvements in agricultural and other machines, and in 1761 held an exhibition of models of machinery in its rooms. In June, 1828, a public Exhibition of Arts and Manufactures was held in London, under the patronage of a distinguished committee, at the Royal Mews, Charing-cross, which stood on the site of Trafalgar-square.

The Royal Dublin Society, for more than a century, has been the constant patron in Ireland of Exhibitions of manufactures, of art, and of agriculture, and has thereby won for itself an enviable distinction among the Royal Societies of Europe.

Exhibitions of exclusively Irish manufactures had been held under the auspices of the Royal Dublin Society (established in June, 1731), on their premises, at different times between the years 1834 and 1847, and were attended with very great success. So far back as 1829 one was proposed to be held. In the year 1850 it was determined by the Council to hold an *International* Exhibition, the first of the kind ever held in the United Kingdom, followed by the Great Exhibitions of 1851 and 1862, in London, under the auspices of the late lamented Prince Consort, by the National Exhibition, in Cork, in 1852, and by the Irish Industrial Exhibition of 1853, which was held on the Dublin Society's premises, by means of the liberality of Mr. W. Dargan, who on that occasion was the sole guarantor. In the previous exhibitions of manufactures held in Ireland and England, the exclusion of foreign products was one of the leading principles adopted. They were, on that account, essentially expositions of native manufactures. To the Royal Dublin Society the honour is then due of first *practically* removing this restriction, by liberally opening their honours and prizes for competition to the manufacturers



Park will remember the surprise and admiration which the vast collection of objects there gathered together created. The area of the building was 800,000 square feet, or a little more than 18 acres, a space between three and four times as large as that occupied by any previous Exhibition abroad; and this space was subsequently increased by additional galleries to rather more than one million of square feet.

The whole available space was divided equally, one half being reserved for the United Kingdom and her Colonies, and the other apportioned to Foreign countries. The number of British packages received was nearly 21,000, and the Foreign and Colonial 12,550. The Exhibition was opened by Her Majesty, on the 1st May, and closed on 15th October, remaining open 141 days.

	Estimated value of Exhibits.	No. of Exhibitors.
United Kingdom, - -	£1,031,607	7,382
British dependencies, - -	79,902	
Foreign countries, - -	670,420	6,556
	<hr/> £1,781,929	<hr/> 13,938

The number of prize medals awarded was 2,918, and of council medals 170.

The following is a return of the number of admissions and receipts:—

	Admissions.	Receipts.
By payment at doors, - - -	5,265,429	£356,278
„ season tickets, - - -	773,766	67,514
	<hr/> Total, 6,039,195	<hr/> £423,792
Other Receipts, - - -	-	82,308
		<hr/> Total receipts from all sources, - - - 506,100
Less:—		
Expenditure, - - -	-	292,795
		<hr/> Balance, - - - £213,305

The largest number present was on Oct. 7, being 109,915.

In a paper read by Lord Henry G. Lennox, M.P., before the Society of Arts, January 24, 1866, he observed:—"It may be and is undoubtedly true, that as a nation we were, at the Exhibition of 1851, not equal to the French in our designs and in our appreciation of artistic beauty of form, but it is also true that at the Exhibition of 1862 our inferiority was admitted on all hands to be unspeakably less apparent than it had been eleven years before on a similar occasion. Nor is it necessary to look far for the causes which have led to this healthy change in the public mind. Undoubtedly much is due to the spread of education and the consequent enlightenment and civilization of the people, but it is also, and in a great degree, due to the remarkable success achieved by the Great Exhibition of 1851, which, under the direction of the Prince Consort, was generated within these walls. But few of those who were watching events at that time can fail to remember what occurred after the close of this great experiment. A lull followed as deep as the excitement had been great. Certain propositions had been laid down by those who had recommended the Exhibition to public favour. To this challenge no hasty answer was given even by those classes who would benefit most largely by the success of these principles. With the caution of Englishmen they were weighing the merits and demerits of the



## CORK NATIONAL EXHIBITION.

In 1851 a local Exhibition for Munster was suggested to be held at Cork, by Mr. Daniel Corbett, which, from being a mere city and county display, became a National Exhibition. Subscriptions were obtained towards the object in many of the leading towns of Ireland, and H.R.H the late Prince Consort gave £100 towards it. The Exhibition was opened on the 10th June, 1852, and was kept open until the 11th September. The building, enlarged and adapted for the purpose, was the Corn Exchange Hall, and the superficial area available was 42,525 feet, which was subsequently supplemented by a gallery 90 feet long by 15 feet wide. It was opened by the Lord Lieutenant, Lord Eglinton. The receipts were £8,733, and the expenditure was a few pounds in excess. The number of visitors on season tickets was 54,936, and of those who paid at the doors 74,095. Of the latter number, 6,022 paid 2s.; 18,937 paid 1s.; 1,018 paid 1s. 6d.; and 48,118 paid 6d. But there were 9,344 school children admitted gratuitously, bringing up the total number who visited it to 138,375.

## CORK NATIONAL EXHIBITION OF 1852. — BALANCE SHEET.

RECEIPTS.			EXPENDITURE.		
	£	s. d.		£	s. d.
To Subscription account—			By printing, stationery, &c.,	353	8 5
General subscription, - £2,049 10 0			Police and detective force,	770	5 3
Bandon subscription, - 37 4 0			Deputations, - - - -	62	0 0
Corporation of Waterford, 22 8 0			Bands, - - - - -	123	6 0
Clonmel subscription, - 20 0 0			Miscellaneous, viz.—Hire of		
Corporation of Limerick, 20 0 0			steamer, furniture for		
Dublin subscription, - 541 1 6			banquet, balls, &c., cost of		
Galway do. - 8 7 6			fountain, vote to Passage		
Kinsale Commissioners, 5 0 0			regatta, liveries to porters,		
Kilkenny subscription, 22 8 0			&c. - - - - -	£91	5 2
Limerick do., - 66 0 0			Preparing plans, police,		
Queenstown do., - 4 10 0			lamps, attendance, glazing		
	2,799	1 0	pictures, and sundries, not		
Season tickets, - - - -	1,545	7 0	included in other account, 86 13 8		
Daily admission, - - - -	2,874	13 10	Sundry expenses, messenger,		
Banquet, Balls, &c.—			wages, postage, repairs,		
Banquet, - - - - - 283 7 0			damage to goods, &c., - 134 1 3		
Balls, - - - - - 593 13 0			Fire Insurance on Corn Market		
			premises, - - - - - 43 10 0		
			Incidental expenses, including		
Catalogues, - - - - - 95 5 6			staff and office, cartage of		
Refreshments, per Mrs. Fitzgerald, - 55 0 0			goods, &c., not included in		
Miscellaneous—Receipts on account of			wages or railway account, 110 10 2½		
Lectures, - - - - - 32 7 0			Regatta prize cup voted, - 62 10 0		
Material—Receipts of sales by Auction, 357 14 9½			Salver voted to Mr. Belshaw		
Received from Mr. Dargan			in testimony of his services, 25 0 0		
for glass cases, - 75 0 0			Sundry items, including com-		
Received from Mr. Dargan			penetration for injuries; not		
for forms, &c., - 13 13 4			coming under the other		
			specified expenses, - - 37 11 4		
Police refunded, - - - -				581	1 7½
			Wages and labour, - - - -	1,731	10 0
	8,727	10 11½	Decorations, not including contracts, - 199 3 7		
Cash overdrawn for Re-			Contracts—Richd. R. Boylan		
gatta Cup, - - - - 2 10 0			for decorations, - - 375 11 9		
Do. Bank, - - - - 2 18 0			Wm. Jones on acct. for do. 154 7 3		
			Ormond and Meade on acct.		
	5	8 0	of buildings, timber, &c. 672 6 1		
Balance due the Treasurer, - - - 12 1 1			Law costs, - - - - - 6 15 3		
				1,209	0 4
			Railway, steam charges, and		
			transit of goods, &c. - - - 133 1 8½		
			Materials—Paid for building		
			materials, &c., - - - - 1,902 14 7½		
			Music at Inauguration, - - - 265 4 6		
			Advertisements, &c., - - - 392 1 8		
			Refreshments for guests, &c., - 25 19 9		
			Banquet, balls, &c., - - - 985 7 7		
			Subscriptions not paid, - - - 10 0 0		
	£8,745	0 0½		£8,745	0 0½











## PARIS EXHIBITION, 1855.

The twelfth Exhibition in Paris, being the first great French International Exhibition, resembled very closely the plan of the London Exhibition of 1851. It was opened on the 15th May, 1855, and closed on the 1st December. The number of visitors was 4,533,464. The lowest rate of admission was four *sous* (two pence), and there were many days on which the building was open free. The total number of exhibitors was 20,839, of whom 9,790 were French; 1,500 from the United Kingdom; and nearly 1,100 from the British Colonies.

The value of British industrial exhibits was	-	-	-	-	-	-	-	-	£693,627
„ of the fine arts,	-	-	-	-	-	-	-	-	137,560
									<hr/>
									£831,187

Of the British exhibitors, 931 received honorary medals, 15 the grand medal of honour, 32 the medal of honour, 301 the first class medal, 53 the second class medal, and 230 honourable mention. The total receipts of the Exhibition were about £118,000.

## MANCHESTER EXHIBITION, 1857.

The Manchester Fine Arts Exhibition was opened on the 5th May, 1857. The area of the building was about 18,000 square yards. The number of admissions reached 1,336,715; of these 283,177 were season ticket holders. The largest attendance was on the 13th October, when nearly 30,000 were present. The total receipts were £110,588, of which £11,769 was realized by the sale of the buildings, &c. The season tickets at £2 2s. and £1 1s. brought in £23,015, and the admissions at the doors, £60,905. The following is a summary of the objects of fine art shown:—

Ancient Masters,	-	-	-	-	-	-	-	-	-	1,173
Modern Pictures,	-	-	-	-	-	-	-	-	-	689
Portraits,	-	-	-	-	-	-	-	-	-	386
Water Colour Drawings	-	-	-	-	-	-	-	-	-	969
Sketches and Original Drawings,	-	-	-	-	-	-	-	-	-	200
Engravings,	-	-	-	-	-	-	-	-	-	1,475
Miniatures,	-	-	-	-	-	-	-	-	-	560
Photographs,	-	-	-	-	-	-	-	-	-	597
Architectural Drawings,	-	-	-	-	-	-	-	-	-	63
Sculpture,	-	-	-	-	-	-	-	-	-	100
										<hr/>
Total,	-	-	-	-	-	-	-	-	-	6,212

ART TREASURES EXHIBITION, MANCHESTER, 1857.					
RECEIPTS.			EXPENDITURE.		
	£	s. d.		£	s. d.
Season Tickets, 9,562, at £2 2s., -	20,080	4 0	Land and roads, -	5,247	11 1
Season Tickets, 2,795, at £1 1s., -	2,934	15 0	Building, &c., -	37,933	3 6
			Internal fittings, decorations, &c., -	18,581	2 6
Admissions at the doors, 131,608, at 2s. 6d., -	16,451	0 0	Salaries, wages, &c. -	12,467	19 9
Admissions at the doors, 856,256, at 1s., -	42,812	16 0	Police, -	3,644	12 7
Admissions at the doors, 65,674, at 6d., -	1,641	17 0	Packing and conveyance of contributions to and from the building, -	11,531	7 10
			Travelling expenses, -	1,198	13 10
Catalogues, general, -	7,733	8 8	Advertising, placarding, &c., -	2,684	19 10
Do. supplemental, -	337	0 6	Printing catalogues, -	4,801	1 6
Do. softages, -	41	10 0	General printing and stationery, -	1,938	18 8
			Office expenses, furniture, &c., -	1,042	16 4
Other publications, programmes of concerts, -	239	9 7	Rent of offices, rates, and taxes, -	454	10 1
Sundry pamphlets, -	26	1 0	Postages, telegrams, &c., -	253	18 3
			Insurances, -	1,958	15 4
Refreshment contract, -	3,346	9 5	Music, erection of organ, organ performances, &c., -	5,032	6 8
Taking charge of umbrellas, sticks, parasols, &c. -	1,488	8 8	Legal expenses, -	97	19 6
Commission on sale of medals struck in the building, -	327	3 11	Interest, &c., paid Bank of England, -	1,413	18 1
			Balance, -	304	14 4
Rent of book stall, -	216	0 0			
Sale of stereoscopic views, building, -	116	13 0			
Mr. Greenwood, for omnibus privileges, -	100	0 0			
Season ticket cases, -	403	8 0			
The council of the Manchester Botanical Society, -	97	0 7			
Rent of opera-glass stall, -	50	0 0			
Do. of stand for bath chairs, -	24	0 0			
For the recovery of lost property, -	31	10 8			
Proceeds of sale of internal fittings in Dec. 1857, -	1,824	4 1			
Proceeds of sale of building in May, 1858, -	6,486	5 4			
Proceeds of sale of timber and materials Sept. 1858, -	623	7 10			
Sundry private sales of fittings, stores, and large glass cases, -	2,836	2 7			
Excess of cash over numbers indicated by turnstile registrations, and for unrepresented tickets sold, -	319	13 10			
	13,128	5 11			
	£110,588	9 8		£110,588	9 8

An Art Exhibition was held on the Royal Dublin Society's premises in 1858, which was attended by 55,318 persons; 1,661 season tickets were sold, and 27,024 paid for admission at the doors. It was opened on the 6th of April, by the Earl of Eglinton, the Lord-Lieutenant, and President of the Society, and closed on the 19th June. The receipts, in the eleven weeks it was open, amounted to £1,072, although the entrance fee was placed as low as 3d. and 1d. The nucleus of the Exhibition was the loan collection of the Science and Art Department at the South Kensington Museum, London, sent over in charge of Mr. Worsnop, besides which there were

3,147 objects exhibited in the hall and galleries, comprising, among others, 837 oil paintings, 600 photographs, 65 water-colour drawings, 58 engravings and etchings, 39 miniatures, 28 pieces of sculpture, 162 carvings and models, 8 stained glass windows, and 250 articles of jewellery and plate.

It must be obvious that Exhibitions such as these are the only possible means by which the general public can gain an inspection of by far the greater number, if not all, of the objects of art, belonging to private individuals, deposited, as they generally are, in the collection or cabinet of the connoisseur, to be there viewed by his private friends or acquaintances only; and thus must be apparent the importance of such undertakings receiving the encouragement of all who are friendly to the advancement of art. It was well observed by Lord Clarendon, at one of the meetings:—"Industrial Exhibitions of this sort are the best answers to charges that are often made against people in this country (sometimes well-founded charges) that a plan or project is taken up too warmly and then abandoned too hastily; that, in fact there is overmuch imagination brought to bear on practical matters, and from a want of union, patience, and perseverance, a collapse ensues, and the fabric raised by hope disappears in the slough of despond. But I think these exhibitions are practical refutations of such charges. They have gone on increasing in number and improving in quality, even in times of the greatest depression, and creating a spirit of honourable rivalry, which each year took a fresh start, and led to fresh improvements in the following out. These exhibitions are a great practical lesson, affording examples (which must do good), of how excellence is to be attained, and where shortcomings lie." We may also quote as opportune the following pertinent remarks of the noble Earl:—"Among other things we find that sewed muslin is rapidly establishing itself as a national industry, and affording employment to our female population. Look at the lace of various kinds made at Limerick, among others the Valenciennes lace, which cannot be distinguished from the best foreign; and I know from one of the principal importers himself, that if he could secure this in sufficient quantity from Ireland he would suspend all his orders abroad. I have seen here embroidered muslins equal to any that are produced in Switzerland. We have most of us seen the splendid productions that Dublin will contribute to the Exhibition—the silk, the damask, the tabinet, the cloth, the worsted lace, the plate, the jewellery, and other works—all of which assert the skill and taste of the manufacturers, and the spirit with which they have come forward to prove what Ireland can do, and that she shall not lag behind in the race of universal competition. My own impression is that Ireland at last is on the road to become what she ought to be; that our agricultural and manufacturing prosperity is not an idle dream, nor a problem impossible of solution; but that industry and energy have already accomplished much, and sufficient to encourage us to persevere in endeavouring to turn to the best account the many bounties which nature, with no niggard hand, has lavished on this country."

Whilst International Exhibitions have answered in a marked degree the objects contemplated by their promoters, namely, to bring together the best products of all nations, and by encouraging a friendly rivalry in manufactures to stimulate each exhibitor to use his utmost exertions to improve and extend his own products, it must be apparent that they are attended with very grave responsibilities and very serious expenses, and that to render them successful, a considerable interval should necessarily elapse between them. These objections, however, do not present themselves to the holding of what may be called *local* Exhibitions, the difficulties attending which are small in comparison, and the expenses much lighter. Hence the Royal Dublin Society resolved to resume their periodical exhibitions of exclusively Irish manufactures, and of home and foreign machinery, adapted to manufacturing purposes.







## DUBLIN FINE ARTS EXHIBITION, 1861.

In 1861, however, another Art Exhibition was held by the Society, and the interest taken by the public in the opportunity for instruction and enjoyment afforded them was shown by an attendance of 208,516 persons. The Society was honoured with contributions from the collections of Her Majesty the Queen, His Royal Highness the late Prince Consort, and His Majesty the King of the Belgians; also from the Hampton Court, Sheepshanks, Vernon, and many other galleries, whilst the co-operation of artists and private collectors was largely afforded. The Exhibition was open 136 days. His Royal Highness the late Prince Albert visited this Exhibition. There were 106,720 day visitors, and 101,796 by night; the average attendance being 785 by day, and 1,542 by night. The largest number present on one night, exclusive of season ticket holders, exhibitors, and members of the Royal Dublin Society, was 4,635, on the 16th October.

ROYAL DUBLIN SOCIETY'S FINE ARTS EXHIBITION OF 1861.									
RECEIPTS.				EXPENDITURE.					
	£	s.	d.		£	s.	d.		
To 1,753 Season Tickets sold, -	1,460	17	6	By Building, -	2,886	8	5		
" Amount received for 156,386 admissions, -	6,414	1	0	" Fittings, including repairs, &c., -	319	6	0		
" " " Sale Ticket cases, -	7	11	0	" Gas fittings, -	169	5	5		
" " " Catalogue, -	529	4	6	" Gas light -	361	8	10		
" Rent of refreshment room, -	65	0	0	" Wages, -	1,077	9	9		
" Grant from Committee of Manufactures, -	300	0	0	" Salaries, -	235	7	6		
" Commission on sale pictures, -	17	14	0	" Advertising, -	854	14	0		
" Timber and materials sold, -	395	0	2	" Travelling and office expenses, -	62	8	11		
				" Music, -	1,071	17	2		
				" Insurance, -	117	9	2		
				" Police, -	107	9	3		
				" Packing, freight, and carriage, -	530	9	10		
				" Printing, stationery, and postage, -	816	18	11		
				" Gratuities, -	331	8	0		
				" Expenses of Kensington travelling museum, -	53	19	8		
				" Incidental expenses, -	162	7	4		
				" Prizes for copies of pictures, -	31	0	0		
	£9,189	8	2		£9,189	8	2		

## LONDON INTERNATIONAL EXHIBITION, 1862.

In 1858 the Society of Arts again took the initiative for repeating a great International Exhibition in London, to mark the decennial progress of art and manufactures; but the Italian war, and the disturbed state of the Continent, caused the matter to be postponed, and it was carried out in 1862 by a Royal Commission, consisting of five gentlemen, nominated by the Society of Arts, three of whom had acted on the Commission for 1851. A large guarantee fund was raised, and a suitable building was erected on land at Kensington, which had been purchased with the balance remaining over from the former Exhibition. On this occasion, Music, Painting, and Photography were included in the display, and considerable care was given to the Fine Arts department, that being the leading untried feature in connexion with English International Exhibitions. The commissioners decided that the display of the British School of Art should be limited to the works of artists living within the century prior to 1862, but that foreigners

should have liberty to select their art specimens without any such chronological restriction. The result was a very fine display of pictures and sculpture, and a small collection of photographs.

INTERNATIONAL EXHIBITION, LONDON, 1862.			
ANALYSIS OF RECEIPTS AND EXPENDITURE TO 20TH APRIL, 1863.			
RECEIPTS.		PAYMENTS.	
	£ s. d.		£ s. d.
Season tickets :—		Preliminary expenses and law charges, . . . .	3,668 1 8
Ordinary, . . . . .	£78,894 7 0	BUILDINGS :—	
For shilling days only, 1,681 10 0		Design and professional superintendence, - £3,600 0 0	
		Drawings, plans, models, &c., - - - - -	4,722 18 8
	80,575 17 0	Contractors for original contract, £200,000, on account of 3rd £33,845 13s. 9d., 233,845 13 9	
Less commission allowed to agents, . . . . .	903 15 9	Eastern annexe, extra works and fittings, - 86,833 1 4	
	79,672 1 3		329,001 13 9
Admission by payment at the doors and by day tickets, . . . . .	328,858 0 5	Roads and approaches, - - - - -	13,358 13 8
Refreshment contracts, . . . . .	29,235 4 11	Insurance and expenses of fire brigade, - - - - -	4,087 14 1
Official catalogues, . . . . .	3,919 1 10	Computation of space and general arrangement, . . . . .	3,675 11 0
Licences to photograph, . . . . .	1,925 0 0	CEREMONIALS :—	
Licence for letting opera glasses on hire, . . . . .	250 0 0	Opening ceremony, 1st May, . . . . .	8,579 11 7
Rent for telegraph office, . . . . .	100 0 0	Declaration of awards 11th July, . . . . .	557 2 4
Umbrella stalls, . . . . .	2,118 12 10		4,136 13 11
Retiring rooms, . . . . .	1,000 0 0	Salaries and wages, . . . . .	45,778 0 8
Commission on photographs, medals, &c., sold in building, . . . . .	1,241 9 6	Water supply, . . . . .	760 3 2
Incidental receipts, . . . . .	262 1 5	General maintenance, &c. . . . .	1,784 5 5
Contribution from Mr. J. Kelk, under terms of agreement, dated 10th September, 1862, . . . . .	11,000 0 0		2,544 8 7
		Police, . . . . .	19,435 19 11
		Fuel for boilers, gas, &c. . . . .	3,007 11 1
		Travelling expenses, . . . . .	462 18 3
		Medals, . . . . .	6,409 6 4
		Fine Art department (carriage of pictures, &c.), . . . . .	4,201 17 2
		Rent, taxes, and repairs of office, . . . . .	979 14 1
		Office furniture, . . . . .	1,458 12 9
		Postage, . . . . .	790 9 11
		Stationery, printing, and lithography, . . . . .	4,407 17 6
		Advertisements, . . . . .	2,466 5 5
			10,102 19 8
		Incidental expenses, . . . . .	1,645 12 9
		Interest on temporary loan from Bank of England, . . . . .	8,414 12 11
		Less interest on investment and exchequer bills, . . . . .	1,083 10 4
			7,330 13 7
		Total, . . . . .	£458,847 15 8
		Balance, . . . . .	783 16 6
	£459,631 12 2		£459,631 12 2

We insert here a return of the number of exhibitors in each class, approximately, and the gross space each occupied, for comparison with other exhibitions. The classification adopted by the Dublin Exhibition Committee, in 1865, it will be seen on reference, differs slightly from that adopted in 1862 :—







## SECTION I.—RAW MATERIAL.

	Exhibitors.	Space—Square feet.
Class 1. Mining, quarrying, metallurgy, and mineral produce, -	360	8,400
" 2. Chemical substances and products, and pharmaceutical processes, -	202	5,100
" 3. Substances used for food, including wines, -	163	4,500
" 4. Animal and vegetable substances used in manufactures, -	247	75,000

## SECTION II.—MACHINERY.

" 5. Railway locomotives, &c., -	83	113,532
" 6. Carriages not connected with rail or tram roads, -	116	
" 7. Manufacturing machines and tools, -	241	
" 8. Machinery in general, -	242	
" 9. Agricultural and horticultural machines and implements, -	150	33,800
" 10. Civil engineering, architectural, and building contrivances, -	164	13,962
" 11. Military engineering, armour, and accoutrements, ordnance, and small arms, -	130	12,610
" 12. Naval architecture, and ship's tackle, -	150	
" 13. Philosophical instruments and processes, -	149	7,625
" 14. Photography and photographic apparatus, -	165	2,966
" 15. Horological instruments, -	130	2,700
" 16. Musical instruments, -	91	5,870
" 17. Surgical instruments and appliances, -	134	2,475

## SECTION III.—MANUFACTURES.

" 18. Cotton, -	63	4,684
" 19. Flax and hemp, -	81	6,433
" 20. Silk and velvet, -	64	4,722
" 21. Woollen and worsted, including mixed fabrics, -	235	26,093
" 22. Carpets, -	44	
" 23. Woven, spun, felted and laid fabrics, when shown as specimens of printing or dyeing, -	51	3,546
" 24. Tapestry, lace, and embroidery, -	85	5,307
" 25. Skins, furs, feathers, and hair, -	68	1,316
" 26. Leather, including saddlery and harness, -	135	4,583
" 27. Articles of clothing, -	201	7,402
" 28. Paper, stationery, printing, and bookbinding, -	223	6,250
" 29. Educational works and appliances, -	234	4,344
" 30. Furniture, and upholstery, and paper hangings, -	258	25,272
" 31. Iron, and general hardware, -	409	25,522
" 32. Steel and cutlery, -	127	13,326
" 33. Works in precious metals and jewellery, -	84	7,968
" 34. Glass, -	81	15,680
" 35. Pottery, -	62	5,475
" 36. Manufactures, not included in previous classes, -	31	2,800
	5,453	386,703

## ROYAL DUBLIN SOCIETY'S EXHIBITION, 1864.

In 1864 another of the Royal Dublin Society's triennial meetings was held. The Committee stated that they were of opinion that the time presented peculiar facilities for the promotion of Manufacturing industry; and from the gradual development of its mineral wealth, the extension of railways in Ireland, the increased application of steam, the invaluable water power, and the important advances which Manufactures had made in many districts, during the past fifteen years, it was a suitable occasion to exhibit such Manufactures as were produced in the country, with a view to ascertain how they could best be promoted and extended. The announced object was "to ascertain, with a view to special encouragement, those manufactures the raw materials for which can be successfully grown or produced in Ireland. It has already been found that this prevails to a very considerable extent, as, for instance, in the articles of linens, thread, friezes, tweeds, blankets, flannels, serges, ratteens, woollen and worsted yarns, stockings, leather, boots and shoes, with other kinds of manufactured goods in leather; paper of every description, envelopes, starch, candles, soap, brushes, perfumery, combs, felt, cabinet work, railway and other carriages, agricultural and other implements, bricks, tiles, pottery ware, marbles, fishing appliances, ironmongery, metals, glass, bookbinding, chemicals, artificial manures, liquors for dyeing purposes, and for domestic

use. There are other descriptions of manufactures carried on, the raw materials for which come from abroad, but before being manufactured into fabrics, &c., have to pass through many processes, in themselves sources of considerable employment, such as cambrics, muslins, laces, embroideries, calicoes, domestics, cotton yarns, winceys, shawls, and other kinds of mixed fabrics, pins, hooks-and-eyes, straw-plait, artificial flowers, surgical instruments, machinery of every kind, locomotive and other engines, &c."

Very active exertions were made to ensure a successful display, and visits were made by some of the Committee to the principal towns in Ireland, and to the chief manufacturing districts of England, to obtain the co-operation of machinists in contributing machinery suited to manufactures. So many applications came in under the latter head that the Committee found it necessary to cover in the Shelbourne yard at a cost of £1,400, and appropriate it wholly to the display of machinery, chiefly in motion. It was subsequently resolved that a Fine Arts gallery should be added to the Exhibition, and 466 pictures were obtained on loan, besides a number of photographs. In the industrial department there were 412 exhibitors. The Exhibition was opened on the 25th May, and closed on the 31st December. The charge for admission was 1s., and the Exhibition was open from 11 in the morning till 5.30; and in the evenings from 7.30 till 10. Although there was music daily, on Friday evenings a special concert was given, and the charge for admission was raised to 1s. 6d. The total number of visitors, exclusive of attendants, was 335,577, of whom 65,000 were season ticket holders, 167,645 payments at the doors, 80,000 visits by members of the Dublin Society, and 27,932 admitted free. A guarantee fund was started at the outset, which was met by subscriptions for £10,681. This Exhibition resulted in a small deficiency, and some dissensions arose between the guarantors and the Royal Dublin Society, as to the fair value of the buildings taken over by the Society. The total receipts from every source were £11,873; of this £11,449 was proper revenue, the residue being derived from extraneous sources. The expenditure amounted to £14,099.

# DUBLIN INTERNATIONAL EXHIBITION, 1865.

WE now come to the decennial Exhibition, which this work is specially intended to record, and which owes its origin to the Winter Garden Company, and to the erection in the city of Dublin of a permanent building, admirably fitted, with but slight additions and alterations, for the purpose of holding a great Exhibition. The Directors of the company naturally thought it a favourable opportunity to inaugurate the completion of their successful labours with a great International Exhibition; and, undaunted by the difficulties that stood in the way of its accomplishment, they boldly set to work, undeterred by the prognostics of failure which were hinted in many quarters. Eleven years had elapsed since the close of the Exhibition so patriotically carried out in Dublin, by the munificence of Mr. William Dargan, and the experience that had been since gained in Exhibition arrangements, and the possession of a fine building, were thought to be highly favourable towards ensuring a successful issue.

It becomes necessary, in the progress of our history, to trace the origin of the building which was ultimately so worthily filled with treasures of Art and Industry.

The following was the original Prospectus issued by this Company:—

## THE DUBLIN EXHIBITION PALACE, AND WINTER GARDEN COMPANY (LIMITED).

INCORPORATED PURSUANT TO ACT OF PARLIAMENT.

Capital, £50,000 (with power to increase) in Ten Thousand Shares of Five Pounds each Share.

Ten Shillings per Share to be paid on application, and Ten Shillings per Share on allotment. The remaining Four Pounds per Share to be paid in Four Calls of One Pound each, with Three Months at least between each Call.

Trustees—HIS GRACE THE DUKE OF LEINSTER, LORD TALBOT DE MALAHIDE, BENJAMIN LEE GUINNESS, Esq., D.L.

Directors: *Chairman*—HIS GRACE THE DUKE OF LEINSTER, Carton, Maynooth. *Vice-Chairman*—BENJAMIN LEE GUINNESS, Esq., D.L., Stephen's-green, South, Dublin.

The Rt. Hon. DENIS MOYLAN, Lord Mayor, Mansion House  
 Lord WILLIAM FITZGERALD, Harcourt-terrace, Dublin  
 Lord Viscount SOUTHWELL, Shaftesbury House, Kensington  
 Lord TALBOT DE MALAHIDE, Malahide Castle  
 The Rt. Hon. ALEX. MACDONNELL, Tyrone House, Dublin  
 The Hon. JOHN P. VEREESE, Merrion square, South, Dublin  
 The Hon. St. JOHN BUTLER, Walshestown, Balbriggan  
 The Hon. Judge BERWICK, Upper Merrion street, Dublin  
 Sir J. JOCELYN COCHILL, Bart., D.L., Belvedere House, Drumcondra  
 Sir ROBERT SHAW, Bart., Bushy Park, Rathfarnham  
 HENRY ANDREWS, Esq., Dame-street, Dublin  
 FRANCIS W. BRADY, Esq., Q.C., Lower Leeson-street, Dublin  
 MAURICE BROOKS, Esq., Sackville-place, Dublin  
 JOHN CAMPBELL, Alderman, J.P., Mountjoy-square, Dublin  
 ROBERT CHAMBERS, Esq., J.P., The Castle, Kingstown  
 CHARLES COBBE, Esq., D.L., Newbridge House  
 ROBERT G. COLLIS, Esq., Aston's-quay, Dublin  
 WILLIAM DARGAN, Esq., D.L., Mount Anville, Drumcondra  
 DAVID DRUMMOND, Esq., Dawson street, Dublin

ALEXANDER JAMES FERRIER, Esq., William-street, Dublin  
 WILLIAM FOOT, Esq., J.P., Rutland square, Dublin  
 EDWARD FOTTELL, Esq., J.P., Harcourt street, Dublin  
 JOHN FRY, Esq., Westmoreland street, Dublin  
 THOMAS M. GRESHAM, Esq., Sackville-street, Dublin  
 CHAS. WILLIAM HAMILTON, Esq., J.P., Dominick-st., Dublin  
 EDWARD H. KINAHAN, Esq., Merrion square, Dublin  
 JAMES MARTIN, Alderman, J.P., Fitzwilliam square, Dublin  
 VALEN. O'BRIEN O'CONNOR, Esq., D.L., Rockfield House  
 THOMAS PIM, Esq., South Great George's-street, Dublin  
 FRANCIS ROBINSON, Esq., Mus. Doc., Fitzwilliam-street, Dublin  
 GEORGE ROE, Alderman, D.L., Nutley, Donnybrook  
 WILLIAM RUSSELL, Esq., J.P., Sackville-st., Lower, Dublin  
 GILBERT SANDERS, Esq., Foster place, Dublin  
 THOMAS C. SCOTT, Esq., Merchant's-quay, Dublin  
 WILLIAM R. STEPHENS, Esq., Blackhall-place, Dublin  
 CATTESON SMITH, Esq., P.R.H.A., Stephen's green, Dublin  
 JOHN W. SWITZER, Esq., Grafton street, Dublin  
 THOMAS VANCE, Esq., J.P., Blackrock House  
 JOHN E. V. VERNON, Esq., D.L., Clontarf Castle  
 JAMES WEST, Esq., J.P., College green, Dublin

**Bankers**—THE ROYAL BANK OF IRELAND, DUBLIN.

**Stock Brokers**—Messrs. SMITH and DU BEDAT, No. 11, College-green, Dublin. Messrs. WOODLOCK and O'DONNELL, No. 42, Dame-street, Dublin.

**Advising Architect**—FREDERICK DARLEY, Esq., No. 26, Lower Fitzwilliam-street, Dublin.

**Law Agent**—EDWARD HUDSON, Esq., No. 28, Gardiner's-place, Dublin.

**Secretary**—HENRY PARKINSON, Esq.

**COMPANY'S OFFICES**—No. 112, GRAFTON-STREET, DUBLIN.

The Dublin Exhibition Palace and Winter Garden Company has been established to provide an Institution which will afford to the people of Dublin and its neighbourhood rational amusement, blended with instruction, and thus supply a want which has been long felt in this City.

For this purpose it is proposed to erect a Building of an ornamental and appropriate character, which will comprise a Winter Garden, adorned with the choicest plants and exotics, and which may be also used for the Exhibition of Horticulture, and for Promenades Musicales, when required—a Concert Hall suitable for the largest Concerts, and for the production of the works of the most eminent Masters, with an effect not hitherto attainable in this City—a Concert Room adapted for the Musical Societies of Dublin—a Gallery for the Exhibition and Sale of Pictures and Articles of Vertu—a Department for the display of Manufactures and Useful Arts—a Polytechnic Museum, and Theatre for Lectures on popular subjects, and particularly on the Natural and Mechanical Sciences, aided by chemical and such other experiments as may best illustrate these subjects. It is also proposed that the Building shall comprise a Public Bazaar, for the sale of articles exhibited, Reading Rooms, Refreshment Rooms, Gymnasium, &c., &c.; and that it shall be placed in the centre of Ornamental Pleasure Grounds, in which the skill of the Landscape Gardener will be displayed.

Although Dublin and its suburbs have nearly doubled in population and wealth during the last forty years, no adequate effort has as yet been made to meet the improved tastes and wants of this population for rational Amusement.

The public advantages of such an institution as the Dublin Exhibition Palace in a populous City like Dublin are manifest; it would bring within the reach of all classes the civilizing influence of Music and the Fine Arts, which at present even the most wealthy of citizens rarely enjoy. It would aid in the Study of the Natural and Mechanical Sciences by an Exhibition of their most remarkable examples; and by blending amusement with instruction, would thus elevate and improve the tastes of all. Such an Institution is at present one of the great wants of this City.

The most suitable site for the proposed Palace and Gardens has been a matter of much consideration, as the Building should be placed within easy reach of the most populous districts, while the Gardens and Grounds, to be effective, should be of considerable extent. The Directors, after carefully considering these matters, have selected as the most eligible, the lands known as the Cobourg Gardens. A portion of this property had been recently purchased by Benjamin Lee Guinness, Esq., who, with his wonted liberality when the public interest can be promoted, placed same, on favourable terms, at the disposal of the Company. The Directors have also been in treaty for the adjoining portion of the Hutchinson estate, and have accepted the terms upon which it will be leased. These lands, together, will form a Park of upwards of Fifteen Acres within the City Boundaries.

This site is in the immediate neighbourhood of some of the most populous and wealthy districts of Dublin. It is within easy reach of the flourishing suburbs of Rathmines, Rathgar, Rathfarnham, &c.; while it adjoins the Bray Railway Terminus, and is within a few minutes' walk of the Westland-row Station.

These Lands (The Palace Park) will afford ample space to develop the objects and resources of the Company, and the Directors believe that, upon the erection of this building, the surrounding land will soon be covered with first-class Houses, which would thus place the Dublin Exhibition Palace in the very centre of one of the most fashionable and wealthy Districts of the City.

For some months past the Directors have had under their consideration the extent of accommodation which each department comprised in this undertaking may require, with the object of ascertaining the sum which may be necessary for the construction and arrangement of the Building and Grounds; and, after carefully estimating these matters, they believe that £50,000 will be sufficient for the Capital of the Company.

The Directors, while seeking to effect a great public object, desire it to be understood that this Company has been established on a purely commercial principle, believing this to be the only basis on which such an Institution can be permanently maintained.

Institutions of this description have proved eminently successful in other large towns; and even the late Exhibition in Kildare-street, which was only open during the five Summer months of 1861, and for a temporary

purpose, realised the large income of £8,776 upon the small Capital invested in the Building ; and had the Exhibition remained open for the Winter Season, that sum would have been probably more than doubled.\*

The Income of the Dublin Exhibition Palace and Winter Garden Company will be chiefly realised by the receipts from Ordinary Public Concerts, Promenades Musicales, Subscriptions to the Institution, and Sale of Season Tickets ; Hire of Public Rooms for Exhibitions, Lectures, Private Concerts, Meetings, &c., &c. ; Public Lectures on Scientific and other subjects, Commissions on Sale of Paintings and other Articles, Rents of Bazaar Stalls, Refreshment Rooms, and of space for goods exhibited for Sale. In addition to these and many other sources the Directors expect a large Income will be realised from Oratorios, Musical Festivals, and the production of the most attractive and legitimate Exhibitions and Novelties which may from time to time appear in the Chief Capitals of Europe, and which, in the Exhibition Palace, and with the resources of the Company, can be produced with much effect, and with advantage to the Shareholders. The Directors, after a careful estimate of even the ordinary Income of the Company, believe that it will pay to the Shareholders a large dividend on the Capital invested.

In June, 1862, the Directors advertised in the public journals that they were prepared to receive designs and plans for the Exhibition Palace and Winter Garden Buildings, proposed to be erected by the Company—the expenditure not to exceed £35,000. £150 premium was offered for the best design, and £75 for the second best. The time for sending in designs was fixed for the 1st August, but this was subsequently extended to the 1st September, 1862.

In response to the public announcements a number of very beautiful designs were sent in, many of them reflecting the highest credit on their authors for originality of design, accuracy of drawing, and the care with which the various details had evidently been attended to. The competitive designs sent in were on view to the public at the Exhibition Hall, College-street, for about a month, at a nominal charge of sixpence for admission.

It now became necessary to adopt some mode by which the most suitable design could be selected for the purposes of the Company. To obtain this result a special committee was appointed, who devoted a considerable period of time to a strict examination in detail of all the plans and drawings submitted.

This committee at length sent in their report, by which it was found that not one of the designs that afforded the required accommodation, when the test of measurement was applied, could be carried into execution, with proper materials, for anything like the sum named in the printed instructions.

Under these circumstances there remained only one of two modes of proceeding to take, namely—either to invite a fresh competition, or to select the design that approached the nearest to the requirements of the Company, for further consideration, with a view of reducing the expenditure. To save time this latter course was adopted, and the plans of Mr. A. G. Jones were selected. This gentleman received instructions to reconsider his design in conjunction with Mr. F. Darley, advising architect to the Company, and make such alterations as were calculated to reduce all unnecessary expense.

To get a respectable contractor to carry out the adopted plans expeditiously, and on reasonable terms, next engaged the anxious attention of the Directors. To obtain this desirable result, the contract was offered for competition, bills of quantities prepared by eminent surveyors, were supplied, and every facility afforded to competitors for testing their accuracy.

A number of tenders were received, at the appointed time, from eminent firms, and, the matter having received the most mature consideration of the Directors, it was finally decided to

\* During the Twenty-five weeks the Dublin Exhibition of 1853 remained open, One Million One Thousand Two Hundred and Sixty-eight persons paid for admission, of which number about Five Hundred and Seventy-one Thousand One Hundred and Seventy-nine paid One Shilling each. In 1861, One Hundred and Fifty-five Thousand Seven Hundred and Sixty Persons (exclusive of Exhibitors and Members of the Royal Dublin Society) visited the Fine Arts Exhibition during the Five months it remained open.

accept the tender of Messrs. Beardwood and Sons, of Dublin, for all the buildings, according to Mr. Jones's plans.

The Dublin Exhibition Palace and Winter Garden stands upon a site of about fifteen statute acres, formerly known as the Cobourg Gardens, bounded on the west side by Harcourt-street, on the north by Stephen's-green, on the east by Earlsfort-terrace, and on the south by Hatch-street. The several buildings cover an area of about five statute acres, and consist of two distinct constructive features, viz., the Main Building, which is a brick and stone structure, with cement lining, and the Winter Garden and Exhibition Building, which is of iron and glass. In addition to these there is a permanent annex structure of stone, with iron roof and glazed skylight, at the north side of Winter Garden.

#### LAYING THE FOUNDATION STONE.

The ceremonial of laying the foundation stone of the Dublin Exhibition Palace and Winter Garden took place on the 12th June, 1863, on the grounds in rear of Harcourt-street, under auspicious circumstances. The portion of the building selected for this ceremony was the south angle of the semicircular transept of Exhibition building. The weather was favourable, except that previous to the ceremony a slight shower, peculiar to the season, descended. It was so light that it caused no inconvenience to visitors, and almost proved agreeable. If proof were wanted, it only showed the necessity of the building, the foundation stone of which was about being laid. The scene was peculiarly gratifying to all who are interested in the prosperity of Ireland. A field which some few months since was a barren waste, had been partially converted into a blooming garden, where the mind can be improved, and the body invigorated by healthful exercise. Throughout the grounds ornamental mounds are being raised, artificial fountains, mazes, and other attractions to interest the visitor, but time will be required to develop and mature the ornamental plants and shrubs with which the place will abound. The ground is beautifully situated, being in close proximity to what it may be anticipated will ere long be the people's town park, namely, Stephen's-green. The first stone was laid in the centre of what will be the principal aisle. The grounds surrounding it were enclosed and boarded over. Close by the principal entrance in Earlsfort-terrace was a large marquee erected for the reception of his Excellency and the principal visitors. Around were a number of designs illustrative of the building, which were placed for the inspection of his Excellency. Along the sides of an enclosed space fronting his Excellency's marquee was a line of soldiers of the 19th regiment, under command of Captain Foster, and close by the splendid bands of the 5th Dragoon Guards and 58th regiment, which played before and after the ceremonial. In front of his Excellency's tent were a number of marquees for visitors. These were crowded with ladies, who seemed much interested in the proceedings. Suspended from the marquees were a number of handsome flags and streamers. Shortly before three o'clock his Excellency the Lord Lieutenant, accompanied by Mr. Hatchell, private secretary, Captain Moore, A.D.C., and Major Cockerell, A.D.C., arrived at the principal entrance in Earlsfort-terrace. He was received by the following directors and members of the committee:—His Grace the Duke of Leinster, Mr. Benjamin Lee Guinness, Mr. William Dargan, Mr. Vance, Mr. T. Gresham, Alderman Campbell, Alderman Martin, Mr. Ferrier, Mr. Gilbert Sanders, Mr. Russell, Mr. Scott, Mr. David Drummond, Mr. F. W. Brady, Q.C.; Mr. Andrews, Mr. Switzer, Mr. Brooks, and Mr. H. Parkinson, the secretary. His Excellency was conducted to the Viceregal tent, where he inspected the plans of the building. He then proceeded to lay the stone in the usual form. Mr. Alfred Jones, the architect, presented him with a beautiful silver trowel for the purpose, which had been specially manufactured by Mr. Brunker, of Grafton-street. It was greatly admired for its beauty and originality of design. The handle was composed of bog oak, elaborately carved and entwined with shamrocks. The blade was chased with designs illustrating the Arts and Sciences,

with a view of the building and grounds, the whole entwined and ornamented with wreaths of shamrocks and other Irish emblems. It bore the following inscription:—"Presented to his Excellency the Earl of Carlisle, Lord Lieutenant General and General Governor of Ireland, on the occasion of his laying the first stone of the Company's Concert and Exhibition Building, June 12th, 1863. The Duke of Leinster, chairman; Benjamin Lee Guinness, vice-chairman; William Dargan, deputy vice-chairman; Henry Parkinson, secretary; Frederick Darley, advising architect; A. G. Jones, architect; Alderman Hudson, solicitor; and Messrs. Beardwood and Sons, contractors." A sealed bottle, containing a copy of the *Irish Times*, *Saunders's News-Letter*, *Freeman's Journal*, *Express*, *Evening Mail*, and *Evening Post*, with the current coins of the realm, and a scroll stating that the first stone of the building was laid by Lord Carlisle, as Lord Lieutenant of Ireland, on Friday, the 12th of June, 1863, was placed under the foundation stone, which his Excellency duly laid. Mr. H. Parkinson, as secretary of the company, then read the following address:—

"To his Excellency George William Frederick Howard, Earl of Carlisle, Lord Lieutenant General, and General Governor of Ireland.

"MAY IT PLEASE YOUR EXCELLENCY—We, the directors and shareholders of the Dublin Exhibition Palace and Winter Garden Company, beg leave respectfully to tender our grateful acknowledgments for the readiness with which your Excellency responded to our wishes in consenting to lay the foundation stone of the proposed building. We would very briefly on this occasion call the attention of your Excellency to the objects expected to be attained by the promoters of this undertaking. Notwithstanding the largely increased population and wealth of Dublin within the last few years, and its rank as the second city in the empire, it has long been matter of observation and surprise that it contained no institution where the citizens might meet for the purposes of rational amusement blended with instruction—no gardens or place of public assembly of a character similar to those existing in many of the continental cities. To supply this want the buildings which your Excellency has this day commenced are intended. They will comprise a winter garden, where horticultural exhibitions and promenades may be held; a concert hall suitable for the production of the works of the great masters with an effect not hitherto attainable in this city; a smaller concert hall, adapted for the musical societies of Dublin; a gallery, for the exhibition and sale of pictures; a department for the display of manufactures and useful arts; a polytechnic museum and theatre for lectures on popular subjects, the whole to be placed in ornamental pleasure grounds, in which the skill of the landscape gardener will be displayed. Some delay was experienced in procuring a suitable plan to embrace the various objects mentioned, but the directors have much confidence that the buildings when completed will be found as advantageous and appropriate as the capital at their command warranted them undertaking. The company has been formed on sound commercial principles. The capital was subscribed in a short space of time by upwards of 600 shareholders, including among persons of every rank, his Grace the Duke of Leinster, who has, as chairman, given the company the benefit of his valuable advice.

"Through the generous co-operation of our vice-chairman, Mr. Guinness, the greater portion of the land occupied by the company has been placed at its disposal on most advantageous terms, and we venture to express a hope that the Dublin Exhibition Palace and Winter Garden will prove by its ultimate success that the anticipations of its founders have not been formed in vain. In conclusion, it is a subject of much congratulation to us that the building will be commenced by a nobleman who has always given a helping hand to institutions calculated to advance the social condition of the people of Ireland, and has, in this instance, shown a marked proof of interest in our enterprise, by becoming a shareholder in the company."

His Excellency the Lord Lieutenant, in reply to the address presented to him, said—"My Lord Duke, Ladies, and Gentlemen, I can assure you that I have come to the discharge of my allotted part in the ceremony of this day with especial pleasure. I feel this in two capacities. In my first, as one of your brother shareholders, I could not fail to witness the inauguration, under such auspicious circumstances, of this undertaking with interest and hope, because I trust, in addition to other advantages to which I shall in a moment allude, it will prove highly remunerative. Next, as the Chief Governor for the time being, of this country, I cordially sympathize with the higher and more disinterested motives which have presided over the whole progress of the design, and I rejoice sincerely that among the multiplied instances of increasing enterprise and improving taste of this community—among the many ecclesiastical, collegiate, municipal, and commercial structures which rise on every side of us—one spot should be set apart for bringing rational and refined enjoyment within the reach of all classes, and adding to the public stock of blameless amusement. It will, indeed, be the best, though we do not wish it to be the only reward of the friends and patrons of this enterprise, when they shall be enabled to see large numbers of their fellow-citizens with their wives and families issuing, perhaps, from humble homes, and closing the labours of the counter and the factory, in the unrebuked enjoyment of the beauties of nature and the treasures of art. The list which your address contains of the varied attractions which are to be gathered in this favoured spot, portrays an enchanted scene where Flora is to girdle the shrine of every grace and every muse. I feel, however, that we need not resort to fable or fancy, when we find our undertaking fostered and supported by the genial patronage of Leinster, the untiring benevolence of Guinness, the practical energy of Dargan. May the blessing from on High allow, prosper, and hallow our work."

His Excellency, amidst loud cheers, declared the stone well and truly laid. Cheers were given for Her Majesty, the Lord Lieutenant, Mr. Benjamin Lee Guinness, and Mr. William Dargan. The ceremonial then concluded.

The weather proving favourable, a considerable number of visitors remained, enjoying the pleasures of the promenade, and inspecting the grounds. It is to be regretted that the principal entrance is not in Harcourt-street, which would be the most suitable place for it, being easier of access, and nearer to the city. In front of the imposing garden *façade* are the principal architectural terracings and geometric grass garden, with its circular basins, statuary, vases, and panellings. Then, as a terminus to the central broad walk or terraced promenade, a capacious basin has been made, about 80 feet wide, constructed in rustic or rock-work fashion, so that from a second basin of minor dimensions, elevated about 14 to 16 feet, a cascade of water can be projected, and so constructed that it may, when required, be illuminated in various colours. The broad margin of this rocky fountain will be tastefully studded over with a rich garniture of some of the more beautiful and spreading alpine plants. The levels of the several fountains, basins, &c., will be so adjusted that a ready circulation of the periodic supplies of water may be made continuous, falling from one to the other, and again sent by steam-power or otherwise up to the more elevated large rocky fountain alluded to. Such is a description given by Mr. Niven, to whose artistic care the arrangement and decoration of the grounds has been confided. The planting will consist chiefly of hardy evergreens and flowering shrubs. Most of the mounds to be planted are finished. The archery ground, surrounded by grassy slopes, is perfect, and the outlines of broad walks, terraces, &c., are laid out, so that the ground is fast assuming the appearance it will have when laid out with fountains, cascades, labyrinths, and Turkish kiosks. The front of the building has a handsome pedestal with Corinthian columns supported by Doric pillars, and along the front extends a colonnade, the windows being designed in the Byzantine and Italian style.

## THE DINNER AT THE ANTIENNT CONCERT ROOMS.

On the following evening, June 13th, 1863, a dinner was given by the Directors of the Winter Palace Company to commemorate the laying of the foundation stone of the building. It was held in one of the large rooms of the Antient Concert Building, Brunswick-street, and was served in a style of great elegance. At seven o'clock, upwards of seventy gentlemen sat down to dinner.

Amongst those present were—His Grace the Duke of Leinster; Benjamin Lee Guinness, the Hon. George Handcock, Thomas M. Gresham, Thomas M. Scott, John W. Switzer, Francis Robinson, Mus. Doc., Catterson Smith, P.R.H.A., William Foot, J.P., William Russell, J.P., Thomas Vance, J.P., Gilbert Sanders, William Dargan, J.P., D.L., David Drummond, F. W. Brady, Q.C., Henry Andrews, Edward Fottrell, J.P., W. R. Stephens, John Fry, Maurice Brooks, Arthur Edw. Guinness, William Salter, and John H. Read, Esqrs.; Alderman Campbell, J.P.; M. Niven and N. B. Tabuteau, Esqrs.; Alderman Hudson; F. Darley, A. G. Jones, W. C. Beardwood, John Ambrose Coffey, Edward Mainwaring, H. Parkinson, J. H. Read, Jun., T. Brunker, R. M. Ordish, C.E., and Richard Martin, J.P., Esqrs.; Alderman Boyce, J.P.; Charles Cummins, Esqr., &c.

His Grace the Duke of Leinster presided, and Mr. Benjamin Lee Guinness occupied the vice-chair. Grace having been said, and the cloth removed,

His Grace the Duke of Leinster proposed the health of "Her Majesty the Queen," which was drunk with the usual honours.

His Grace again rose and proposed the health of "His Royal Highness the Prince of Wales, the Princess of Wales, and the rest of the Royal Family."

The Duke of Leinster then proposed the toast of the "Lord Lieutenant, and prosperity to Ireland." Drunk with the usual honours.

His Grace next proposed the toast of the "Army and Navy," coupled with the name of Captain De Courcy, of Her Majesty's ship "Ajax," who he very much regretted was absent. It should be stated that Captain De Courcy most kindly lent the flags of the "Ajax" to decorate the exhibition grounds on the occasion of the laying of the foundation stone.

The Duke of Leinster next proposed the toast of the "Lord Chancellor and the Irish Bench, and the Irish Bar."

Mr. F. W. Brady, Q.C., responded, and in doing so observed that he feared he was placed in a false position in being called on to respond to the toast on behalf of the Irish Bench. He regretted extremely that as a junior member of the Bar he should be called on to respond to so important a toast; however as one interested in the success of the Dublin Exhibition Palace and Winter Gardens, he hoped the Directors might never in connexion with the building know the Irish Bench or Bar in its judicial capacity, but rather in a social aspect. (Hear, hear.)

The Duke of Leinster next proposed the toast of the evening, "Success to the Dublin Exhibition Palace and Winter Gardens," coupled with the name of Mr. Benjamin Lee Guinness. (Applause.) They were all aware how much the country was indebted to Mr. Guinness, who was principally instrumental in forwarding the project. The toast was drunk amidst loud applause.

Mr. Benjamin Lee Guinness responded. He said:—"My Lord Duke and Gentlemen, I really know not in what adequate terms to return you my most grateful thanks for the kind way my health has been proposed and received. I am almost ashamed that I should be so much individually connected in your good feeling and wishes with this great and useful undertaking, which we have all united to carry forward in Dublin. Having taken a very humble part in the matter I could wish I had devoted more time to it, but I must say whatever time I had to spare, or whatever ability I possess, have not only been at the disposal

of the company, but ever shall be. (Applause.) I very much admire the view which his Excellency took of it on the preceding day, when he said it was a benevolent, kind, and considerate thing to provide innocent amusement for those who were not able to provide it for themselves. I think providing innocent recreation and amusement, something that will soothe the sorrows of those not so blessed by Providence as we are, is a thing much to be desired in a community like ours. We are blessed with wealth, and an opportunity of contributing to the happiness of those not able to provide for themselves, and I, therefore, greatly rejoice that this undertaking has been brought forward. I cannot, individually, claim any merit for having originated the thing, but I confess I have been most anxious to forward it. I sincerely believe that great success will attend this company because of the admirable selection we have made of a chairman. The first of Irishmen, the noblest of the noble, the most ancient amongst our distinguished families is his Grace the Duke of Leinster. I think if one thing has distinguished him more than another it is that urbanity and kindness which all who have been in any way connected with his Grace have experienced. Since this institution was started, and we had the good fortune to obtain him as our president, nothing but unanimity and good feeling has existed. I will therefore take a liberty with the Duke and with the gentlemen present in asking permission to propose a toast which will appeal to the heart and sympathies of all present, namely, 'Long life and prosperity to his Grace the Duke of Leinster.'" (Applause.)

The toast was most cordially received.

His Grace the Duke of Leinster briefly responded. He said:—"Mr. Guinness and gentlemen, I return you my most sincere thanks for the kind manner in which Mr. Guinness has proposed my health, and the kind way in which you have received it. It gives me very great pleasure that I happen to have time to attend to the interests of the company of which you have been so kind as to appoint me chairman. When Mr. Darley first called on me and mentioned the matter, I was not aware how very useful the thing would be. It did not at first strike me, and I told him I would be very glad to assist, but I did not mean to become connected with the company. However, on the matter progressing, and when I found, as Mr. Guinness expressed it, what great benefit it would be to the middle and lower classes in Dublin to have a place where they could meet and enjoy themselves, I then went hand and heart into it, and it will afford me the greatest gratification if I see this great undertaking carried out, as I have no doubt it will be, with benefit to the shareholders, and very great benefit to the people of Dublin generally."

The Duke of Leinster next proposed the health of "The Guests," coupled with the name of the Hon. George Handcock. The toast was drunk with the usual honours.

The Hon. George Handcock responded. He said:—"Gentlemen, as his Grace has been kind enough to couple my name with the health of the guests, the pleasure of returning thanks for them devolves on me, and I do so with the most sincere gratification. Upon my own part and theirs I thank you for the hospitable manner in which we have been treated here this evening, invited to a banquet given in honour of the laying of the foundation stone of the Dublin Exhibition Palace and Winter Garden. I conceive it to be great honour, indeed, to be invited to take any part whatever in the inauguration of a design which I have not the least doubt will exercise a salutary effect, not only upon the citizens of Dublin, but casual visitors who may visit the city. I quite agree with Mr. Guinness that anything that can tend to elevate the tastes of our humbler brethren is very desirable indeed, and I have no doubt that a work the foundation stone of which was laid yesterday, will, by bringing the middle and humbler classes in contact with the upper, have a beneficial result. We have now inaugurated this undertaking, and I hope my brother guests and myself will shortly have the pleasure of meeting at your hospitable

board on an occasion of greater importance, namely, the opening of the building. I can assure the committee that we will meet them with the greatest possible pleasure, and I hope we will all enjoy ourselves as we have done this evening."

The Duke of Leinster next proposed "The health of Mr. William Dargan."

The toast was cordially received.

Mr. William Dargan responded, and said:—"My Lord Duke and Gentlemen, your Grace may easily imagine the feeling I entertain when rising to acknowledge the very great compliment you have paid me, especially when I remember the approval with which you noticed my career in life. Unhesitatingly I say that no greater compliment could have been paid me. You have been pleased to couple my name with industry and social progress with which the labours of my life have been long connected. I am happy to say I am closely identified with the railway interests of Ireland, and I consider it is for the benefit of the country they should continue and progress. As most of my friends are aware, I usually decline entering into anything of a speculative or public character, but when the present undertaking was mooted, I joined in it with the greatest pleasure. I did so from twofold motives, that it would be useful and valuable as a school of teaching and place of attraction, where men from here, there, or elsewhere would have an opportunity of coming and seeing what they never saw before. And I considered it doubly advantageous because the people of Ireland are essentially a practical and intuitive people, ready to catch at new ideas, ready to take advantage of them, and capable of using them." After some further observations, Mr. Dargan concluded, amidst loud applause, by returning thanks.

The Duke of Leinster next proposed the health of the officers of the company, coupled with the names of Alderman Hudson and Mr. Parkinson.

Mr. Henry Parkinson, secretary of the company, briefly responded.

Alderman Hudson, in replying, said:—"My Lord Duke and Gentlemen, my worthy colleague, with that retiring modesty for which he has never been more remarkable than on the present occasion, and with which we have been often made so familiar, wishes to impose on me the duty of conveying to this company his feeling and sentiments. My Lord, that under any circumstances would be a very difficult task, but at this late hour of the evening I believe it would be impossible, and I will therefore not attempt it. But, so far as I am individually concerned with your Lordship, permit me to express my sincere thanks for the kindness which you have manifested towards me on the present occasion, and, indeed, I may add, for the uniform kindness and consideration I have ever received from your hands as a member of the board over which your Grace presides. My Lord, my official position is but small and trivial indeed compared with the great responsibility which attaches to other members of the board, and more particularly to the architects. These gentlemen will, no doubt, express their own feelings hereafter; but for my part, I may candidly admit, as a lawyer, that the less our services are required the better for our clients. I may, however, be permitted to say, that if my professional assistance shall be ever wanted, that I shall do my utmost to protect and forward the interests of the company. It is a company, my Lord, in which, perhaps, I shall take more than an individual interest, for it was in my house that my friend Mr. Vance, the Secretary, Mr. Darley, and a few other gentlemen present, met to discuss the possibility of establishing such an institution as we yesterday inaugurated. It was they who first considered, shaped, and moulded the form in which the project should be placed before the public. While I state this I am fully satisfied how utterly fruitless and futile all our exertions would have been if they had not been adopted by such a nobleman as your Grace, and if they had not been aided by the kind and benevolent feeling of Mr. Guinness and Mr. Dargan—(hear, hear)—in fact if we were not aided by the other directors whom his Excellency described as possessing all the

elements of success. My Lord, to be the officer of such a directory is to me a matter of some pride. To obtain and secure their good wishes and good opinion will be my anxious endeavour and desire."

Mr. Jones, the architect, and Mr. Niven, to whom the superintendence of the decoration of the grounds has been entrusted, also returned thanks.

The Duke of Leinster proposed the health of the contractors, Messrs. Beardwood and Sons, in whose efficiency and capacity for so great an undertaking he expressed the fullest confidence.

The toast was duly honoured, Mr. Beardwood responding in a practical speech.

His Grace the Duke of Leinster next proposed the toast of "The Press," coupled with the name of Mr. Henry Coulter, its senior member of the metropolitan press present. Mr. Coulter responded. The interesting proceedings shortly after terminated.

The drawings selected in competition were prepared by Mr. Alfred G. Jones, 3, Molesworth-street, Dublin, and a contract having been entered into with Mr. J. P. Beardwood, builder, of Westland-row, Dublin, the works were commenced in May, 1863, and finished in March, 1865.

#### DESCRIPTION OF THE BUILDING, BY MR. ALFRED G. JONES.

The principal entrance to the building is from Earlsfort-terrace, through six pairs of gates which form a portion of the enclosure wall and chain railing; this runs the entire length of Earlsfort-terrace, for a distance of 250 feet along Hatch-street. Each of the gate entrances has four piers of granite, circular on plan, 3 feet 3 inches at base, 8 feet 6 inches high, and surmounted with a cast-iron lamp-post 7 feet high. The iron gates are 15 feet wide, and 6 feet high, hung to massive cast iron hands, which are leaded into the stone piers. The enclosure between the gates consists of a low wall of granite rustic masonry, three courses, each 13 inches high, with a moulded capping of granite 11 inches deep, having square blocks worked on to receive cast iron ornamental standards 3 feet 3 inches high, and 8 feet 6 inches from centre to centre, and having attached from the neck moulding of each the ornamental and cast iron chain railing. There are also intermediate piers of granite 55 feet apart, 2 feet 10 inches square at base, and 7 feet 7 inches high, to receive ornamental cast-iron lamp-posts.

At each entrance are three pairs of gates, two of which are reserved for the entrance and exit of *carriages only*, leading on to a drive 510 feet long by 70 feet wide, the remaining gate being for the use of foot passengers, each roadway having a footpath connecting with colonnade, there being a covered way in front 379 feet long.

The main building, which covers an area of 5,700 square yards, consists of three separate floors, the basement, ground, and gallery floor levels.

The *basement*, which occupies the south portion of main building, covers an area of 1,500 square yards, and is 8 feet 6 inches lower than general ground level, having three means of communication, one external, from the area at south-west angle, and two internal, one at south-east angle of practice room, having a lift in connexion with it to serve up dinners, &c., and the other at exhibition end of south corridor. The main divisions of the basement plan consist of an area which runs the entire depth of the building, 12 feet 10 inches wide, and 20 feet 6 inches wide at south-east angle for a length of 33 feet 10 inches. A passage which also runs the entire depth under the south corridor, on ground floor level. Between this passage and the area is a suite of offices appropriated to the following uses:—A kitchen, 29 feet by 29 feet 9 inches, with range, &c., scullery, lift, still-room, store-room, waiters' pantry, servants' hall, housekeeper's room, pantry, and three larders. These rooms are 9 feet 6 inches high. To the left of area are four vaulted cellars for coal, four water closets, and dust pit. To the right of passage, and under south-west corner of large concert hall, are provided the following:—Beer cellar, wine cellar,













soda water store, and china closet. A passage, 7 feet 6 inches wide, from rear wall of main building, runs for a length of 70 feet, communicating with a kitchen 40 feet by 22 feet 6 inches, under exhibition end of grand central hall, which is provided with an American stove, and has a staircase and lift to a large refreshment and tea room on ground floor.

The *ground floor*, which is 2 feet 6 inches over the level of the ground, comprises the following :—A piazza, which forms the principal entrance, and is approached on the front side by two flights of steps, through three arched openings with quadrant angles, the two side openings having massive piers with coupled columns, in the Roman Doric style, standing out prominently in front, the centre entrance having piers of smaller dimensions, with single columns. The side entrances are also through arched openings with quadrant angles, having on either side a colonnade supported on iron columns, to correspond with those in exhibition building, and a glazed roof with ornamental lamps suspended from the centre colonnade, to the right being 225 feet, and to the left 105 feet long respectively. From the piazza the entrance hall is approached by three door entrances, 8 feet wide; it is 40 feet by 28 feet, having in continuation the grand central hall, which is 130 feet long and 40 feet wide, the whole of which is paved with encaustic tiles. This hall extends through the height of both the floors; it is lit from the top only, and divided on this level by two rows of Caen stone columns with moulded bases and richly carved caps, having anti-pilasters at either side of wall to correspond. Six of these columns are square on plan, and have sunk and moulded panels on each side. The height to ceiling under gallery floor is 18 feet, having an enriched cornice and entablature 3 feet deep, projecting 17 inches from face of wall, and returning along either row of columns which divide the hall into centre aisle, forming the principal communication into iron building, and two side courts intended for the reception of sculpture. The walls have been decorated with dark colours, Pompeian red being the prevalent tone, and this deepening the gloom of the shadow thrown by the galleries serves to throw up the sculpture. The court on the left hand has three doorways entering into large concert-hall and a niche facing the grand staircase. This staircase, the centre of which stands at a distance of 34 feet from entrance hall, occupies a space 39 feet by 14 feet, and forms the principal access to upper central hall, comprising a central flight of ten steps, ten feet wide, with bold curtail steps at bottom. Facing the centre of this flight, and on the first landing there is a niche to correspond with one at opposite side of hall. From this landing start two side flights, having 16 steps each, 7 feet wide; and from second landing the gallery floor level is reached by eight steps; the balusters for this staircase are of ornamental cast iron, to receive a deep moulded handrail of oak let into eight massive newels of wood, standing 5 feet high, and richly carved and moulded; the steps are of Portland stone, and the whole carried on ornamental cast-iron girders. Underneath this staircase (the soffit of which is plastered) are two doorways leading into small concert hall, approached by arched openings through 14-inch wall which carries the landing over; these two walls are terminated by square columns, similar to those before described. There are also doors leading into strong room, and north-east corridor, which is approached by an arched opening from entrance hall, and is 14 feet wide, terminated at a length of 78 feet by a similar opening, which leads into an inner lobby, and is 14 feet wide by 21 feet 9 inches long, communicating in continuation of corridor with winter garden building through an arched opening filled in with sash doors. At the west side of this lobby are two arched openings, through one of which is approached a wide and easy staircase, which leads to gallery floor level. At the east side of this lobby a hall, 16 feet square, is entered, having a small side door leading into winter garden building, and an entrance door 7 feet wide leading out to colonnade. Between this and corridor there is a gentlemen's and ladies' cloak room, each 31 feet long by 14 feet wide, and 18 feet high, each room having a fire-place, two windows with segmental arched heads, 10 feet high and 5 feet wide, and two doors opening into corridor and hall. This hall, which stands in

a central position, is 14 feet square, having an entrance from colonnade 14 feet 6 inches high, and 7 feet wide, segmental arched head door, double hung, and fan-light over. The opening into corridor is through an archway 12 feet wide, with quadrant stopped angles. The ladies' cloak room has in connexion with it two water closets. The north corridor, which runs at right angles to the east one, is 10 feet wide and 130 feet long, terminating with sash doors which open out into exhibition building.

The small concert hall, which is 90 feet long, 50 feet wide, and 56 feet high, in addition to the two entrances before mentioned, has three doorways opening from north corridor, two from east corridor, and one from a lobby which communicates with exhibition end of central Hall. The number of seats provided on this level will accommodate 1,200 persons. The orchestra, which occupies the west end of the room, and has a depth of 24 feet, is 5 feet high at back, with a strand fall of 9 inches to the front, and is constructed to admit of private theatricals, with ample store room underneath. The front, which is of an ornamental character, has a moulded cornice, pilasters with moulded bases, and carved caps, between which are moulded panels; the platform for the singers is constructed in separate pieces, to admit of easy removal; a temporary enclosure, with box for the leader, is also provided for the band. The gallery, which is constructed on framed trusses, carried by 10 ornamental cast-iron columns, has accommodation for 240 seats. It is proposed to erect a second gallery for this concert hall, constructed on cast-iron girders, which will be carried on cast-iron ornamental columns, in continuation of first tier, provision for which has been made in the castings. The approach to this gallery would be from a continuation of staircase at north-east angle, a portion of the roof over north corridor being cut away to supply head room and light. There are at each side of this hall five large semi-circular windows, and two at east end with moulded plaster ribs between, the ceiling being coved and panelled, provided with ventilators and sun-burners for gas light. On left hand side of corridor, commencing at exhibition end, the following suites of apartments are provided:—Ladies' retiring room, 15 feet square, provided with requisite conveniences; retiring room for solo performers, 21 feet 9 inches by 17 feet; retiring room for male chorus, 21 feet 9 inches, by 27 feet, with lavatory and closet arrangements for gentlemen; retiring room for female chorus, with closets and a ventilating shaft, 21 feet 9 inches by 16 feet. From the left of entrance hall the south corridor is entered through an arched opening, and is 14 feet wide by 78 feet long, at the termination of which, through a similar arched opening, the end hall is entered, having an outer entrance on to colonnade, and a wide and easy staircase up to gallery floor level. Off this corridor are two cloak rooms, entrance hall, &c., similar to those described for north side of building. The west corridor, which corresponds with the east one before described, forms the principal communication to the large concert hall, having six doors, 5 feet 6 inches by 9 feet, opening into that room. To the left of this corridor are the following rooms:—One 30 feet by 25 feet; one 30 feet by 28 feet; one 30 feet by 29 feet, for solo performers, with retiring room off, with closets, &c.; a retiring room for ladies, with conveniences; a stairs leading to basement and gallery floor. Central in this corridor, through an arched entrance a hall is entered 30 feet by 15 feet 6 inches, with large entrance door and side lights, which forms the private entrance to the main building.

The large concert hall, which is 130 feet long, 65 feet wide, and 56 feet high, in addition to the doors from west corridor, has three doorways from grand central hall, a central entrance, 26 feet wide, into exhibition, and two side entrances, 7 feet wide, which are filled in with doors sliding into spaces left for that purpose in the walls. This room, which has accommodation for 2,400 persons, has a permanent orchestra at east end, 44 feet deep, and is capable of accommodating nearly 1,000 performers, having, in addition to the permanent seats, several rows of temporary platforms. There is also an organ and two staircases leading down to the bandrooms, which are underneath orchestra. The gallery, which has five rows of seats all round, has accommodation

for 592 persons, and is supported on 19 cast-iron ornamental columns. The light for this hall is obtained through large semicircular windows, seven on each side, and three on each end. The ceiling is coved on all sides with moulded ribs between each window, returning across flat portion of ceiling, and forming it into compartments which are filled in with glass, having ventilating shafts in the centre, and sun-burners to light the hall by night.

#### THE UPPER FLOOR PLAN.

The upper central hall, forming a central communication from main building to the exhibition building through large folding doors, answers the purpose of a picture gallery, having a large amount of wall space for that purpose, and two doors entering into concert hall gallery. The wall on this level is enclosed with four angle pedestals and six intermediate ones, of wood, moulded and ornamented, which are intended to receive statuary, and filled in between with turned wood balusters, capped with richly moulded handrail. The framework of this well-hole, together with the gallery floor, is carried on wood and wrought-iron girders, supported by the Caen stone columns before described. At each entrance to the grand staircase stands a column of Caen stone, panel moulded bases, and carved caps, having a handrail between, with ornamental cast-iron balusters; and at each end also stand two square columns of Caen stone with anti-pilasters similar to columns in lower hall. The ceiling over this hall is coved, and divided into compartments by cast-iron arched ribs, the centre portion being glazed. From this hall the north-east corridor is entered through an arched opening, having off it:—Secretary's office, 17 feet by 14 feet; clerk's room, 14 feet by 13 feet 6 inches; lobby, 15 feet 6 inches by 14 feet; cloak room, 31 feet by 14 feet. At the end a lobby is entered, 22 feet by 14 feet, to keep communication with winter garden, through an arched opening filled in with glazed door. Off this lobby is an office, 22 feet by 16 feet, also two arched openings in connexion with staircase to ground floor. The north corridor, which runs up to exhibition building, from which it is enclosed by sash door, has an open timber roof, with skylight, and two rows of deck lights to supply light to lower corridor, two doors into concert hall gallery, and arched entrance leading into staircase. The picture gallery is 95 feet long and 22 feet wide, the ceiling of the room is covered, the panels of flat portion are filled in with glass, the light being obtained from a skylight which gives a dull light to show the pictures to advantage. There are also ventilators and gas jets to light the gallery by night.

The lecture room, which stands at the back of small concert hall, is similar to the practice room underneath, the floors being secured by two trussed girders; there are two doors into this room, one from the corridor and one from central hall.

The board room, which is over entrance hall and piazza, is 40 feet by 30; three windows facing Earlsfort-terrace, with coupled and single columns in the Corinthian order, standing out in front.

The south-east corridor, which also leads from the central hall to the centre lobby over hall, has two cloak rooms, 31 feet by 14 feet, for use of large concert hall, at the end of the corridor, the space which is occupied being staircase to ground floor, is entered through an arched opening.

The south corridor, off which is the large dining-room, 170 feet long by 30 feet wide, which is divided by a partition the full width of the room, capable of being lowered into a double partition by means of crab winches; this room has six single, and one double window; four fire places, and three doorways into corridor, also serving room, lift, stairs, urinals, and three water closets in convenient positions.

Over the present rooms, adjoining the north-east and south-east corridors, new rooms are intended to be constructed, which will comprise clerks' offices and housekeeper's apartments. The approach to these rooms will be constructed of cast iron perforated staircases, and will start from the present centre lobbies.

## THE MACHINERY ANNEXE.

The machinery annexe, which covers an area of 2,420 square yards, has a roof covering of part iron and wood, carried on wrought iron girders, supported by ten cast iron columns.

This court, which is lit from skylights, is five feet under level of floor, of iron structure, and has an entrance into the Exhibition and Winter Garden building; also a gate entrance into the stable-lane; and has fitted up within it an engine for pumping water throughout the building, and to a large tank on top of same, supplying fountains in the gardens. This engine also supplies hot and cold air as required throughout the various buildings by large flues, 4 feet 6 inches high, by 3 feet wide, which are constructed under ground, and run along the various corridors branching into the concert halls, and all the more important rooms of the building; as also through shafts into the galleries and rooms above. By this means the various halls can be charged with heated air, moistened to Summer temperature, and discharging into large shafts constructed from the ceilings of the concert halls, dining rooms, &c., through the roofs externally, worked by means of a fan.

## THE IRON STRUCTURE.

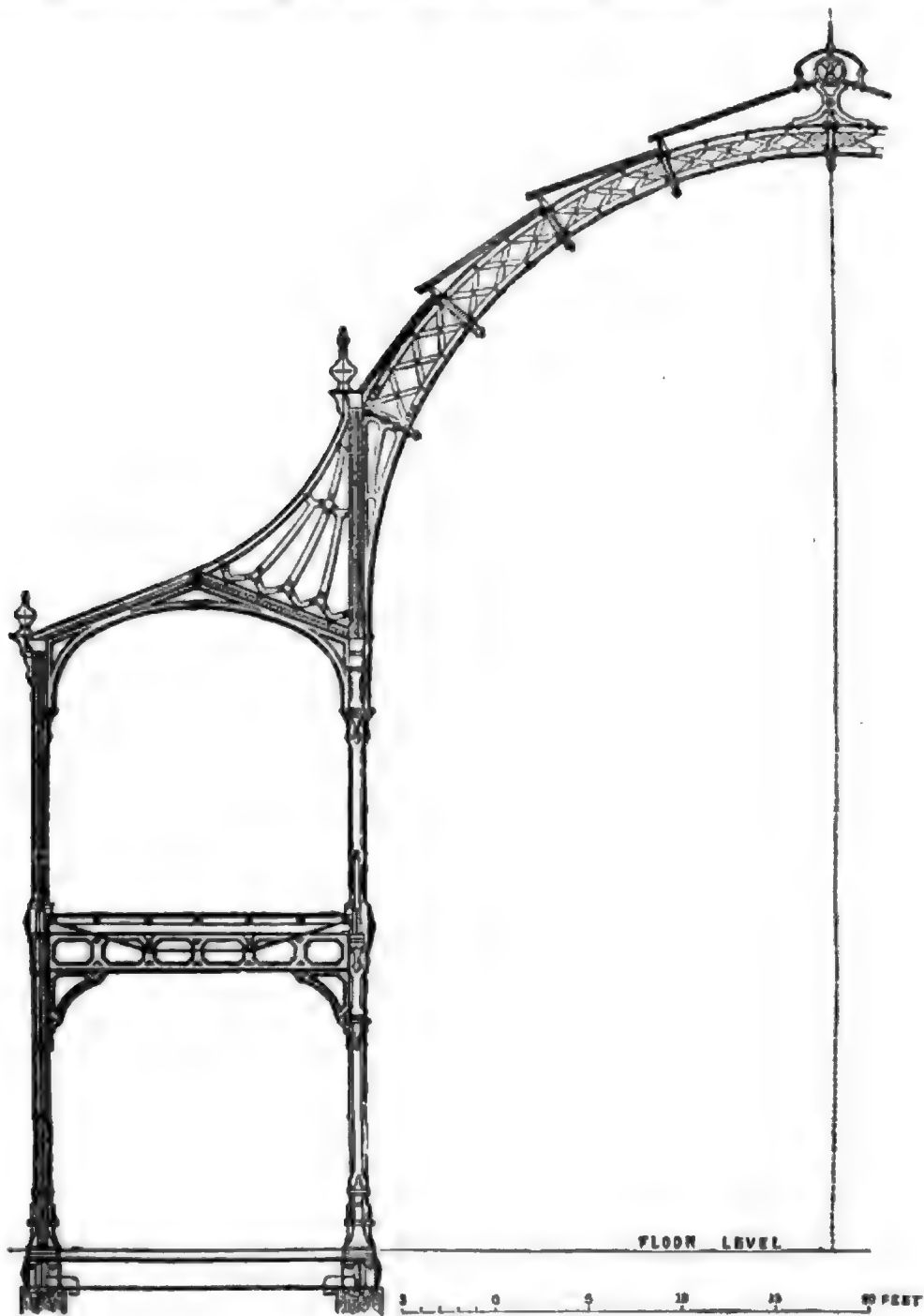
The whole of the iron structure is planned with bays 16 feet 10 inches from centre to centre, and covers a space of 7,300 square yards. The frame-work of this building comprises cast-iron foundation plates, provided with rain-water outlets, to which a portion of the first tier columns are bolted; transverse open work cast-iron girders, bolted or fixed to columns, pilasters and brickwork. Also longitudinal solid web cast-iron girders, connected to columns by dovetailed joints run with lead at the upper part of second tier columns, which are bolted to the first tier; transverse arched roof girders, and longitudinal cast-iron gutters are fixed. The third tier columns to clerestory are bolted to the second tier columns, having longitudinal cast-iron gutters fixed to the tops thereof; cast-iron buttresses are fixed to the third tier columns and to the transverse arched roof of girders. The abutments for the main roof over the nave are cast on the third tier columns. The nave roof principals are formed with angle iron flanges, connected by flat bar lattice work and cast iron bracket struts, to which are bolted the cast iron purlins, this forming an entire self-supporting frame work of iron 60 feet high, to be filled in and covered with wood work, glass, corrugated iron, and zinc. The winter garden portion of the building has a total length of 477 feet, and a breadth of 84 feet, divided into a nave of three bays, or 50 feet 6 inches; and aisles of a single bay each at the sides; the aisles are of two stories in height reaching to the springing of the nave ribs; the floor of their galleries is 18 feet from the ground, and they are roofed over with a continuous span roof. The columns are of cast-iron, and are square, with the angles rounded, have spreading bases and other features of an ornamental character; and the points of connexion between them are the girders carrying the galleries, and all similar points of junction, are skilfully and suitably emphasized.

The flying buttresses above the roof of side aisle distribute the thrust of the nave roof between the outer and inner line of columns; and as these are connected together at their bases by strong plate girders below the ground floor line, and are braced diagonally with horizontal diagonal braces at the level of the gallery floor, it has been found possible so to stiffen the whole aisle as to form a series of buttresses or piers to the nave roof, without recourse to diagonal braces fixed vertically, as is customary.

The gallery flooring is also trussed by these wrought-iron rods, arranged diagonally on plan, by which arrangement the vertical pressure is at once brought on the columns and not transmitted to the girders, thus leaving them to their assigned duty of bracing the structure to resist the thrust of the roof. By this arrangement of the truss rods they also form a horizontal bracing to the galleries, and support the purlins on which the joists bear. The northern and southern

transepts are enclosed and covered with glass, fixed in wood frames and bars. The courts are partially enclosed with corrugated iron, and the roof covered with Italian rolled zinc, and glass.

In the centre of this building is a circular transept, with doors leading into the pleasure grounds, by means of a colonnade and steps, on to a broad terrace. To break the line of steps are granite blocks to receive vases. A large basin fountain and a canal in the centre opposite this transept have been constructed, but are floored over at present. At end of south transept are two staircases of wood, carried on cast iron girders, and leading up to galleries; there is also a similarly constructed staircase at end of north transept, having a centre flight and two side ones to gallery floor level. In addition to the circular projection before described, there are four rectangular projections, three bays of 50 feet wide and 6 feet deep. The centre bay is filled in with doors opening on to landing, and steps which lead into pleasure grounds.



Section of one-half of a Nave Roof Girder.







14 tons, including weight of tackle used. The deflection amounted to half-an-inch, the rib preserved its shape admirably, and no signs of weakness or yielding was perceptible anywhere. The Committee may, therefore, rest assured that the roofs over the Winter Garden and Exhibition Buildings are thoroughly substantial and secure.

"I remain, Dear Sir, your obedient servant,

"WILLIAM ANDERSON,

"Consulting Engineer to the Board."

On the completion of the flooring of the galleries, the contractors further tested their construction by moving over them, in quick step, some hundreds of their workmen, and by placing great weights on same. Mr. Jones, the architect, reported that in all cases the results were most satisfactory.

On the 31st March the galleries were finally and effectually tested as to their strength; and through the kind co-operation of His Excellency Sir G. Browne, K.C.B., Commander of the Forces, and Colonel Kenneth Douglas Mackenzie, C.B., Deputy Adjutant-General, six hundred men of the 78th Highlanders, under command of Colonel M'Intyre, were marched to the Harcourt-street entrance at two o'clock, accompanied by the band of the regiment. Having crossed the pleasure grounds they entered the building, and were massed, or rather packed, in the closest manner upon the gallery of the northern court. At the word of command the men, who came in heavy marching order, advanced with measured tread at slow time, and having traversed the entire circuit of the galleries, changed to quick time, and then again to double quick. They went through a series of evolutions for the purpose of testing the strength of the work, and the spectacle presented was exceedingly picturesque and imposing. So fine a body of men, clad in their national costume, and marching with such precision, could not fail to render the occasion attractive to spectators, and accordingly the transept and courts were crowded with ladies and gentlemen admitted to see this sight; and, though the building was still unfinished, it presented the appearance of a fashionable promenade. The increased tramp of the men increased the effect of their characteristic uniform and martial aspect. At about half-past two the marching concluded, and the band of the 78th, under the direction of Mr. Smalley, played an attractive selection of music. This was the second occasion on which the galleries had been tested. About a fortnight previously, many thousand cannon balls had been rolled about for the course of a day without producing any noticeable deflection, or indicating any weak points. The galleries will never have to bear so heavy a strain again as the weight of 600 soldiers going through numerous evolutions in heavy marching order. The utmost deflection at any point was a quarter of an inch.

The following account appeared in the *London Builder* of April 22nd, 1865:—

The permanent buildings may be classified under two heads, viz., the main building and the Winter Garden; the former of which is a stone structure, the latter of iron and glass construction. The main building contains a grand central entrance hall, with two rows of Caen stone columns, and a principal staircase leading to the gallery above. The lower hall is intended for sculpture, and the upper as a picture gallery, having a curved ceiling, divided into compartments by cast iron arched ribs. Round the gallery railing pedestals are placed, to receive groups of statuary.

The large concert hall on the left hand of the entrance hall provides accommodation for 3,000, the end of which opens into the Winter Garden building, thereby greatly increasing that number, and on ordinary occasions enables the hall to be speedily emptied. This hall is also surrounded by two main corridors, with doors leading into the same; and off the corridors are cloak rooms and rooms for the orchestra use. The orchestra will accommodate about 1,000, and underneath are large rooms for the band, and a double staircase leading to the same. On the

right hand of the entrance hall is the small concert hall, intended to accommodate 1,500, floored over for the present, on the level of the gallery, for the purpose of obtaining an additional large picture gallery. This concert hall is arranged so as to admit of private theatricals. At the end of the hall is a large practice room. This hall is also surrounded by corridors and cloak rooms, together with orchestra accommodation. All the main corridors lead into the Winter Garden, both on the ground floor and upper floor.

There is in the main building on the upper floor a large dining hall, 80 feet wide by 107 feet long, capable of being divided by a double partition, the full width of the room, lowered by means of crab winches. On the upper floor there are also provided, off the corridors, cloak rooms for the use of the galleries of both concert halls; also board rooms and offices, and important staircases. At the rear of the small concert hall (upper floor) is a lecture room for 500 persons; also an extensive permanent picture gallery off the corridor, and the adjoining gallery of the Winter Garden.

Special attention has been devoted by the architect to the easy access to, and egress from, the several portions of the buildings, and ample water-closet and lavatory accommodation is provided throughout. The lavatories, closets, &c., have been provided and fitted up by Mr. George Jennings, sanitary engineer, of London, and have proved highly satisfactory.

The Winter Garden is nearly 500 feet in length, and contains a circular transept in the centre, leading into the pleasure grounds by means of a colonnade and steps on to the terrace. Opposite each colonnade, breaking the line of steps, is a granite block to receive vases. A portion of the Winter Garden continues round the side of the main building towards the front of same, intended to be used as a permanent exhibition, the roof of which, to reduce the amount of light, is covered with Italian zinc, laid in rolls, manufactured by the Vieille Montagne Company of Liège.

It is intended to have a large fountain and canal in the centre of the Winter Garden at the circular transept, which has been floored over at present, the space being required by exhibitors; but there are fountains in the pleasure grounds, and a handsome and extensive cascade, seen from the entrance hall in an effective manner.

Beside the exhibition building is a large permanent annexe, for machinery in motion, fitted up with two engines, one for pumping water throughout the building, and to a large tank on the top of same, supplying fountains in the gardens. This engine also supplies hot and cold air as required throughout the various buildings, through large flues, 4 feet 6 inches high, by 3 feet wide, which are constructed under ground, and run along the various corridors, branching into the concert halls and all the important rooms, and through shafts into the galleries and rooms above. By this means the various halls can be charged with heated air, moistened to Summer temperature, and discharging into large shafts constructed from the ceilings of the concert halls, dining rooms, &c., through the roofs externally, worked by means of a fan.

There is also an annexe for carriages, and one for machinery not in motion; and a fourth for first and second class refreshment rooms and retiring rooms, lavatories, &c.

The principal entrance to the building is from Earlsfort-terrace, through six pairs of gate entrances, for entrance, exit, and foot-passengers. The grounds and drive in front are enclosed with a handsome chain railing and rock-face wall; there is also an entrance through the pleasure grounds by Harcourt-terrace.

We publish an interior view and details of the iron and glass portion of the building as seen from about the centre of the northern transept.

The skeleton of the building is entirely of iron, and is in no way dependent on timber for its support, being so constructed that the side enclosures, gallery flooring, roofing, &c., simply perform their respective duties as inclosures and platforms.



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The building is on plan, multiples of squares of 16 feet 10 inches, by which arrangement a certain regularity in the lengths of the castings and economy are obtained, which is a great desideratum in all iron buildings. The Great Exhibition building of 1851 was set out on squares of 24 feet. The dimensions of 16 feet 10 inches for the Dublin Exhibition was governed by the required dimensions of the masonry portion of the building.

The principal novelty in this structure is that the thrust of the arched roof is resisted without the assistance of diagonal bracing, which has almost invariably been introduced in buildings of this class, forming obstructions and giving the idea of after-thoughts. It will be seen by inspection of the section, that, by means of the buttresses, the thrust of the roof is conveyed to the second tier columns, which are strongly secured to the small arched roof girders, and connected at the bottom to the first tier columns. This mode of construction causes a transverse strain on the columns, to resist which they are made thicker on the sides exposed to this strain. The first tier columns are again firmly connected to the transverse bracket girders at the top, and to girders under the floor level, thus completing a rigid framework to resist the thrust of the arched roof; the sections of the columns and girders, and the strength of the wrought-iron connexions, having been all carefully calculated to resist the various strains.

The gallery flooring is trussed by wrought-iron rods, arranged diagonally in plan, by which means the vertical pressure is at once brought on the columns and not transmitted by the girders, thus leaving them to their assigned duty of bracing the structure to resist the thrust of the roof. By this arrangement of the truss rods they also form a horizontal bracing to the galleries, which underwent a severe practical test as to their strength and rigidity by the marching of a body of troops over their entire extent. The columns, girders, buttresses, and gutters throughout the building are of cast iron. The arched ribs of the main roof are of wrought iron, and the purlins of cast iron.

The northern and southern transepts are enclosed and covered with glass fixed in wood frames and bars. The courts are partially closed with corrugated iron, and the roofs covered with zinc and glass.

The architect is Mr. A. G. Jones of Dublin: the engineers are Messrs. Ordish and Lefevre, of Westminster; the general contractors, Messrs. Beardwood and Sons, of Dublin; and the contractors for the iron work, Messrs. Rankin, of Liverpool.

The decoration of the buildings was entrusted to Mr. Doyle: the prevailing colours are green and grey on the columns and ribs.

#### HYDRAULIC AND VENTILATION ARRANGEMENTS OF THE PALACE AND GROUNDS.

In addition to the two fountains in the grounds, it is proposed that there should be five in the conservatory; the completion of the arrangements connected with the latter remaining of course in abeyance until the Exhibition affairs are entirely closed, as the basins are now covered over by the floor of the building. The most imposing water display in the grounds will, however, be the cascade on the Harcourt-street boundary. The steam power available on the premises will at all times insure an adequate supply of water in the large cistern on the top of the main building; and we need scarcely add that the effect of an abundant supply flowing over a system of rock work some twenty feet high will be very fine. Provision is here made for a flow of 1,400 gallons per minute.

In the two fountains in the grounds, the basins for which are 40 feet in diameter, a variety of forms of jet will be introduced, and these may of course be varied from day to day. It is seldom that effects of this kind are as satisfactory as they might be, owing to the absence of sufficient pressure of water. From this cause the fountains in Trafalgar-square, certainly one of the finest sites in the world, are little better than large squirts, and they form a reproach rather

than an attraction to the great metropolis. We look forward, therefore, to the fountains here affording examples for imitation of what fountains should be in ornamental grounds.

The arrangements for the water supply to the grounds are excellent. Everyone is aware of the necessity of copious waterings at certain periods of the season, to maintain in pleasure grounds that brilliant and fresh appearance which constitutes their leading charm; and yet how seldom is any provision made for the purpose except applications by manual labour. In many situations the supply of water is at such an elevation that power would not be required to make a system of hydrants effective, while the convenience would frequently more than compensate for the outlay in placing the pipes. We can, therefore, scarcely doubt that one of the effects of the system in operation in the Exhibition Palace grounds will be to cause its introduction into many gardens and pleasure grounds throughout the country. The arrangement here is such that any part of the grounds may be watered by merely attaching a hose to one of the numerous hydrants, by means of a screw coupling. The kind of hose to be used will of course regulate the supply of water according to the requirements in each case. The pumping machinery is driven by a *horizontal engine* of 25-horse power, having a cylinder of 16 inches diameter, and 3 feet stroke. In this engine, instead of the usual slide valves, the steam is admitted to the cylinders by double-beat or balance valves, and, by the gearing which gives motion to the valves, the amount of expansion of the steam can be instantly varied to suit the wants of the engine, either by the hand or by the action of the governor. In this particular instance, however, since the resistance to be overcome by the engine is constant, the governor is so timed as not to come into action unless the engine should run beyond its usual speed, from the breaking of a strap or any other accident that would suddenly reduce the resistance. On the end of the crank shaft of the engine is a spur pinion giving motion to a wheel of twice its diameter, fixed on to a shaft on which are two cranks placed at right angles to each other. These cranks work a pair of double action pumps, placed horizontally, having a bore of 8 inches diameter, and 20 inches length of stroke. The valves of these pumps are cylindrical, and entirely balanced under the pressure of the water, a positive motion being communicated to them by a pair of eccentrics fixed on the crank shaft. The water is lifted at pleasure either from a large well sunk under the floor, or from the reservoir pond which receives all overflow water, and is forced through pipes to a cistern placed on the top of the main building, whence the supply for the jet fountains and hydrants in the gardens is obtained. The cistern is also in communication with a series of pipes traversing the whole building, giving at all times an abundant supply of water at high pressure to be made available in the event of a fire.

The fly wheel of the pumping engine is geared with spur teeth, and gives motion to a horizontal shaft overhead, through the medium of a mortice pinion. At one end of this shaft is a large drum, a leather belt on which communicates a rapid motion to a centrifugal pump fixed in masonry below the floor of the engine-room. The centrifugal pump drains its water from the reservoir pond, and delivers it through cast-iron pipes of 18 inches diameter, laid under the gravel walks of the garden, and leading to the cascade.

The overhead shaft also carries another large drum working in a recess in the side wall of the building, and drives a centrifugal fan by a belt. This fan is 9 feet diameter and 4 feet wide, and is fixed in a chamber below the floor of the engine-room. Its object is to supply a current of air to ventilate the main building, the air being carried through an air casing of malleable iron, which also serves to enclose the driving belt of the fan. The air casing communicates with the atmosphere through a large opening in the wall, below which is a valve capable of being acted on or manipulated by a lever at the side of the air casing. When this valve is closed, and another one below the floor is opened, the supply of air to the ventilating fan is driven through conduits from the main building. The current of air, after leaving the fan, is





1900

1901

1902

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1910



received into a chamber, where it will be cooled in Summer by minute jets of water, and heated in Winter by steam pipes; and from this chamber it will be distributed through the building.

The steam is supplied to the engine we have described, and also to those which drive all the working machinery exhibited, by three cylindrical boilers, each 5 feet nine inches in diameter, and 20 feet long, with internal fires and flues. The boilers are roofed with corrugated iron, which being covered over with garden soil at the same level as the gardens, the boilers are entirely concealed from view. It is proposed to erect a conservatory over the boilers, thus rendering available all the radiated heat.

The hydraulic machinery which we have endeavoured to describe has been arranged under the direction of William Anderson, Esq., C.E., and constructed by the engineering firm of Messrs. Thomas Grendon & Co., of Drogheda.

The following quantities of materials used, furnished by Mr. Read, clerk of works, will prove curious and interesting:—

17,625 tons granite rubble stone, or 246,750 cube feet.

1,333,000 stock bricks, or 185,193 cube feet. The stone and brick together would make a column 40 feet square and 260 feet high, or a pyramid 80 feet square at base and 202 feet high. The bricks placed after each other would reach a distance of 187 miles, and would take a horse and cart  $3\frac{1}{2}$  years to draw them from the kiln, distant 5 miles, allowing 2 loads per day.

9,220 tons of sand.

369 tons of Roman and Portland cement and plaster of Paris.

103,857 feet, cube, of timber, which, if cut into scantlings 1 inch square, would reach 2,830 miles, or from Dublin to New York, and 300 miles beyond it.

101,564 feet superficial of glass, or one pane the length of one side of Stephen's-green ( $\frac{1}{4}$  mile), and 77 feet wide.

1,033 tons cast iron. 124 tons wrought iron. 10 tons putty.

Ten miles of hoop iron for bonding the walls of the building and in tonguing the flooring.

Quantity of gas mains and pipes laid and fitted at the Exhibition building by the following firms and contractors:—

Messrs. Edmundson,	.	.	.	5,816 feet.
Mr. Daniel,	.	.	.	1,250 "
Mr. Curtis,	.	.	.	3,779 "
Mr. Gregg,	.	.	.	8,465 "
Alliance Gas Company,	.	.	.	1,600 "
Hibernian Gas Company,	.	.	.	3,763 "

Total, . 24,673, or more than  $4\frac{1}{2}$  miles.

To facilitate the carriage of materials a tramway was constructed all round the main building, at the four angles of which were raised stone hoists and patent mortar lifts—a very ingenious contrivance, by which an immense saving of labour was effected.

All the iron work throughout the building was lifted into its place, without the aid of scaffolding, by a single derrick-pole, secured by guide ropes, a double shears and snatch-block, and a double purchase crab.

No fatal accident occurred during the progress of the works, which is a very fortunate circumstance, considering the magnitude of the undertaking.

## EXHIBITION ARRANGEMENTS.

It having been definitively settled to open the building, now rapidly approaching completion, with an International Exhibition, one of the first steps taken by the Exhibition Committee was to circulate extensively, both at home and abroad, the following prospectus:—

**DUBLIN INTERNATIONAL EXHIBITION OF ARTS AND MANUFACTURES,  
1865.**

**EXHIBITION COMMITTEE:**

The LORD CHANCELLOR of Ireland  
His Grace the DUKE OF LEINSTER  
The EARL OF MEATH  
The EARL OF CHARLEMONT  
The EARL OF HOWTH  
The EARL OF ROSSE  
The MARQUIS OF DROGHEDA  
The EARL OF CLANCARTY  
The EARL OF LUCAN  
VISCOUNT GOUGH  
VISCOUNT POWERSCOURT  
LORD TALBOT DE MALAHIDE  
LORD ANALLY  
LORD CLONCURRY  
The MARQUIS OF KILDARE  
Sir ROBERT SHAW, Bart.  
Sir EDWARD GREGAN, Bart., M.P.  
Sir PERCY NUGENT, Bart.  
Sir J. J. COGHILL, Bart.

Sir RALPH HOWARD, Bart.  
The Rt. Hon. P. P. MACSWINEY, Lord Mayor of Dublin  
JOHN BABBINGTON, Esq., Lord Mayor Elect  
Sir THOMAS DEANE  
Sir BERNARD BURKE, Ulster King at Arms  
Judge BERWICK  
The Hon. ST. JOHN BUTLER  
The Hon. J. P. VEREKER  
The Right Hon. ALEXANDER MACDONNELL  
Major-General COLOMB  
The ATTORNEY-GENERAL for Ireland  
The SOLICITOR-GENERAL for Ireland  
J. E. VERNON, Esq., D.L.  
B. L. GUINNESS, Esq., D.L.  
HENRY ANDREWS, Esq.  
WILLIAM M'KAY, Esq., LL.D.  
CATTERSON SMITH, Esq., P.R.H.A.  
G. F. MULVANY, Esq., Director National Gal., Ireland  
Major-General Sir THOMAS LARCOM, K.C.B.

**EXECUTIVE COMMITTEE:**

GILBERT SANDERS, Esq., M.R.I.A., *Chairman*  
FRANCIS W. BRADY, Esq., Q.C., D.L.  
MAURICE BROOKS, Esq.  
WILLIAM DARGAN, Esq., D.L.  
DAVID DRUMMOND, Esq.  
WILLIAM FOOT, Esq., J.P.  
JOHN FRY, Esq.  
Sir RICHARD GRIFFITH, Bart.  
Sir GEORGE HODSON, Bart.  
Sir ROBERT KANE, F.R.S.  
WILLIAM R. LE FANU, Esq.

J. LENTAIGNE, Esq., D.L.  
THOMAS PIM, Esq.  
WILLIAM R. STEPHENS, Esq.  
JOHN W. SWITZER, Esq.  
THOMAS VANCE, Esq., J.P.

*Honorary Members.*

Mons. GEO. LIVIO, French Consul  
Signor AUG. C. MARANI, Italian Consul  
WILLIAM GARDNER, Esq.  
HERCULES MACDONNELL, Esq.

**AN INTERNATIONAL EXHIBITION OF ARTS AND MANUFACTURES** will be held in Dublin in the year 1865.

Under articles of agreement entered into with the Dublin Exhibition Palace and Winter Garden Company (Limited), all their extensive buildings and gardens have been taken by the executive committee for the period of the exhibition, on terms eminently favourable to the success of the project.

The receipts of the exhibition will be devoted, in the first place, to defraying the expenses attendant on the undertaking; and, in the second place, to paying to the company a certain moderate sum, in consideration of the use of their premises. By the articles of agreement it is further provided that any surplus remaining after these charges have been defrayed, shall be disposed of for the promotion of arts, manufacture, and commerce, in such manner as the exhibition committee may direct.

The buildings thus placed at the disposal of the Executive Committee are situated in ornamental pleasure grounds within the City of Dublin, and are of a very comprehensive character. As will be seen from the accompanying plans, they comprise rooms specially designed for picture galleries, as well as a spacious hall, capable of containing several thousand persons, the whole being admirably adapted for the purpose of an international exhibition.

Her Majesty's Government, recognizing the national importance of the undertaking, has notified it to foreign states, through the Secretary of State for Foreign Affairs. Special Committees have been formed in most of the principal Continental cities, and large assurances of support have been received. The Secretary of State for the Colonies has also addressed letters to the governors of the various British colonies, calling on them to facilitate the exhibition of colonial produce and manufactures. Contributions are promised from the Government collections under the control of the Secretary of State for India, and also from other Government establishments.

The Society of Arts in London, to which the Exhibitions of 1851 and 1862 were eminently indebted for their promotion, have promised to give every assistance in their power to the Exhibition, and have sanctioned the use of their house as the chief office in London.

As every means will be taken to render the Exhibition attractive and successful, the committee trust that all interested in the various departments of art and industry will aid their efforts by a timely and cordial co-operation.

The Exhibition will be opened in May, 1865, and will remain open until the end of October.

HENRY PARKINSON, Secretary.

## DUBLIN INTERNATIONAL EXHIBITION OF 1865.

## DECISIONS OF THE INTERNATIONAL EXHIBITION COMMITTEE ON POINTS RELATIVE TO EXHIBITORS.

1. The Exhibition will open on Tuesday, the 9th day of May, 1865.
2. The Exhibition will take place in the Exhibition Palace buildings, Earlsfort-terrace, Dublin.
3. The Fine Arts department will be placed in the main building, erected in brick and stone. The machinery in a separate court, and the general exhibition will be held in the other portions of the building.
4. No rent will be charged to exhibitors.
5. The productions of all nations will be admitted.
6. The general plan for the division of the exhibition will be similar, as far as practicable, to that adopted at the suggestion of His Royal Highness Prince Albert, for the Exhibition of 1851, viz:—

**RAW MATERIALS; MACHINERY; TEXTILE FABRICS; METALLIC, VITREOUS, AND CERAMIC MANUFACTURES; MISCELLANEOUS MANUFACTURES; FINE ARTS.**

**A—RAW MATERIALS.**

1. Mining, quarrying, metallurgical operations, and mineral products.
2. Chemical and pharmaceutical processes and products generally.
3. Substances used as food.
4. Vegetable and animal substances chiefly used in manufactures, as implements, or for ornament.

**B—MACHINERY.**

5. Machines for direct use, including carriages and railway and naval mechanism.
6. Manufacturing machines and tools.
7. Civil engineering, architectural and building contrivances.
8. Naval architecture and military engineering, ordnance, armour, and accoutrements.
9. Agricultural and horticultural machines and implements.
10. Philosophical instruments and processes depending upon their use; photographic apparatus; musical, horological, and surgical instruments; machinery employed in spinning and weaving, and in the manufacture of wood and metal; machinery in general.

7. Rough counters and wall space will be provided.

8. All goods and articles for exhibition must be delivered at the building at the charge and risk of the exhibitor.

The reception of goods and articles will commence on the 1st of March, and none can be received after the 15th of April.

9. Articles and packages will be unloaded at the building.

Should exhibitors or their agents not be present, the packages will be opened by the officers of the Exhibition, and the contents distributed with the utmost possible care, but at the risk of the exhibitor.

10. Tickets will be issued to every exhibitor, his agent or servant, to enable him to pass into the building until the 8th of May, between certain hours, to arrange the articles for exhibition. These tickets must be produced on entrance, and given up when required.

11. The most effectual means will be taken, through the agency of the police and otherwise, to guard against fire and protect the property in the Exhibition, but the committee cannot be responsible for losses by fire, robbery, accident, or damage of any kind.

12. The committee reserve to themselves the right to exclude any article they may think unsuitable to the exhibition.

13. The following articles will not be admitted:—

Vegetable and animal substances liable to spoil by keeping.

Living animals.

Detonating or dangerous substances, copper caps or other articles of a similar nature, may be exhibited, provided the detonating powder be not inserted; also lucifer matches with imitation tops.

14. Spirits of alcohol, oils, acids, corrosive salts, and substances of a highly inflammable nature will only be admitted by special written permission, and in well secured glass vessels.

Phosphorus, detonating powder, and all substances liable to inflame or explode spontaneously, are excluded.

All acids or other substances of a corrosive nature, and also alcohol, ether, chloroform, and other inflammable liquids are to be enclosed in strong glass bottles, three quarters full, and carefully luted, containing not more

**C—TEXTILE FABRICS.**

11. Cotton.
12. Woollen and worsted.
13. Silk and velvet.
14. Manufactures from flax and hemp.
15. Mixed fabrics, including shawls, but exclusive of worsted goods (class 12).
16. Leather, including saddlery and harness, skins, furs, feathers, and hair.
17. Paper and stationery, printing and bookbinding.
18. Woven, spun, felted and laid fabrics, when shown as specimens of printing or dyeing.
19. Tapestry, including carpets and floor-cloths, lace and embroidery, fancy and industrial works.
20. Articles of clothing for immediate personal or domestic use.

**D—METALLIC, VITREOUS, AND CERAMIC MANUFACTURES.**

21. Cutlery and edge tools.
22. Iron and general hardware.
23. Working in precious metals, and in their imitation; jewellery, and all articles of vertu and luxury, not included in other classes.
24. Glass.
25. Ceramic manufacture, china, porcelain, earthenware, &c.
- 25.\* Antiquities—relics of ancient art in stone, woods, metals, and other substances, with rubbings from monuments.

**E—MISCELLANEOUS MANUFACTURES.**

26. Decoration, furniture, and upholstery, including paper-hangings, papier maché, and japanned goods.
27. Manufactures in mineral substances used for building or decoration, as in marble, slate, porphyries, cements, artificial stones, &c.
28. Manufactures from animal and vegetable substances, not being woven or felted, or included in other sections.
29. Miscellaneous manufactures and small wares.

**F—FINE ARTS.**

30. Paintings in oil and water colours, drawings and photographs, architecture, sculpture, models and plastic art, die-sinking and intaglios, engravings and etchings, enamels and frescoes.

than half an imperial pint each, and are to be placed in trays of lead or gutta percha large enough to contain the contents of the bottles should a breakage occur.

Substances liable to give off an offensive smell must be properly enclosed in air-tight cases; also all substances likely to melt.

15. Any exhibitor whose goods can properly be placed together, will be at liberty to arrange such goods in his own way, provided his arrangement is compatible with the general scheme of the Exhibition, and the convenience of other exhibitors.

16. Prices of articles exhibited may be affixed in all the sections with the exception of fine arts.

17. Exhibitors cannot remove their goods, or substitute others for them, during the period the Exhibition shall remain open, without the permission of the committee.

18. Exhibitors may employ (under the regulations of the committee) assistants, to preserve and keep in order the articles they exhibit, or to explain them to visitors.

19. Free admission, within certain limits, will be given to exhibitors or their agents.

20. Steam and water-power required for the purposes of the Exhibition will be supplied gratuitously.

21. Besides making arrangements for showing machinery in motion, and illustrating it by processes, the committee will reserve space (if early application is made) for the exhibition of processes of manufactures in certain handicrafts, which can be carried on without danger in the building.

22. The committee, considering that it will be interesting and instructive to the general public to have the opportunity of seeing the following and similar processes, will reserve sufficient space for showing illustrations of each of them:—

23. Steel-pen making; pin-making; needle-making; button-making; medal-striking; gold chain making; engine-turning for watches; brick and drain-tile making; glove making; stocking weaving; the manufacture of linens; the manufacture of woollen fabrics; ribbon weaving; glass-blowing on a small scale; type casting; type printing, by hand; lithographic printing; copper-plate printing; earthenware printing; porcelain printing; a potter's wheel; turning in metal, wood, and ivory; lace making of all kinds; bookbinding; tabinet and poplin weaving; straw-plait making; pipe and cigar making.

24. All intending exhibitors must state whether they are the designer, inventor, manufacturer, importer, or producer of the article they propose to exhibit.

25. Packing-cases must be removed and stored at the expense of exhibitors, or their agents, as soon as the goods are unpacked and examined. If not removed within three days after due notice has been given, the packing cases will be removed by the servants of the Exhibition, and the exhibitors will be charged for cartage and storage.

26. The foregoing rule will not apply to the Fine Arts department.

27. Exhibitors must be at the charge of insuring their own goods, should they desire this security.

28. Exhibitors will be permitted, subject only to the necessary general regulations, to erect, according to their own taste, all the counters, stands, glass frames, brackets, awnings, hangings, or similar contrivances, which they may consider best calculated for the display of their goods.

29. The following is the form of address which should be adopted:—

To <i>THE COMMITTEE</i> for the <i>International Exhibition of 1865,</i> <i>Exhibition Palace,</i> From [state country and exhibitor's name.] <span style="float: right;"><i>Dublin.</i></span>	
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30. Intending exhibitors are requested to apply, without delay, to the Secretary for a form of demand for space, stating in which of the classes they wish to exhibit.

31. Medals and certificates of merit will be awarded in all sections except in that of F.

32. It is not the intention of the committee to take any steps in reference to the protection of inventions or designs by patent or registration, the law on those points having been materially simplified since 1851.

33. Arrangements are now being made with the principal railway and steam packet companies having direct communication with Dublin: with a view of obtaining the same facilities for the conveyance of goods to and from the Exhibition as were afforded at the London Exhibition of 1862. Intending exhibitors will be furnished with further particulars on this point.

34. On application by exhibitors empty packages will be warehoused up to the end of 1865, at the following scale of charges, including cartage from and to the Exhibition:—

5s. 0d. per package, not exceeding 3 feet in its greatest dimensions.				
7	6	"	"	4 "
10	0	"	"	5 "
20	0	"	"	8 "

**NOTE.**—To prevent loss, miscarriage, or mislaying, articles, or packing-cases containing them, which occupy less bulk than two cubic feet, should not be sent separately; but packages under such size, containing, as far as possible, the same classes of articles, should be transmitted in combination.

The Lords Commissioners of Her Majesty's Treasury have been pleased to approve of the following regulations in reference to the importation of all Foreign and Colonial goods intended for the International Exhibition to be held in Dublin in the year 1865:—

1. All packages containing goods intended for the International Exhibition of 1865, shall be specially reported as such, and shall be addressed to the Committee of the International Exhibition, or to one of their officers, and be consigned to an importer or a duly accredited agent, and shall be accompanied with a specification of their contents and value. They shall be separately entered as intended for the International Exhibition, and the parties in passing their entries shall specify the full contents of the packages, together with the value.

2. Such packages as may be landed in Dublin shall be forwarded, unopened, to the Exhibition in charge of a revenue officer, accompanied by a cart note from the landing officer, giving a description of the packages and the marks and numbers thereon.
3. Packages landed at other ports than Dublin shall be forwarded with a similar note, by railway or other public conveyance, under seals of office, direct to the Exhibition, the officers of the respective ports taking care that the packages bear no private address, and that the documents relating thereto be immediately forwarded to the proper officers of Her Majesty's Customs stationed at the Exhibition.
4. On the arrival of the goods at the Exhibition, no package shall be opened without the knowledge and consent of the officer of Customs; and if the goods be found to agree with the entry or specification, they will, if free, be at once considered as out of charge of the Customs, the entry or declaration being deemed sufficient for all statistical purposes.
5. In the case of all dutiable goods, an account will be taken by the officers of the Crown at the first time of opening of the packages, but such deficiencies as may occur within the building from any legitimate or unavoidable cause, the officers being fully satisfied thereof, shall not be charged with duty.
6. That the building be considered for all practical purposes, a "bonded warehouse," and that in all cases where dutiable goods shall not be exported, but retained for use in this country, the duty shall be assessed by the officer in charge at the building.
7. In the case of dutiable goods for exportation, an entry shall be passed in the Long Room, and bond given for their due exportation; and on the receipt of this entry by the officer in charge of the building, the goods shall be packed in his presence, and if for shipment at some other port, placed under seal, and forwarded in charge to a railway or other public company; but if for shipment at Dublin they shall be sent in charge of Customs' officers, at the expense of the exporter, to be delivered into the charge of the examining officer of the station from which they are to be shipped, without further examination, under the regulations applicable to goods shipped direct from the warehouse.

## DECISIONS SPECIALLY APPLICABLE TO FINE ARTS.

## CLASS F.

1. No copies, drawings, or photographs of any of the works of art will be allowed to be taken, without the previous written consent of their respective owners.
2. All packing-cases must be legibly marked, on the inside, with the owner's name and address.
3. Distinctive labels will be attached to such works of art as are intended for sale, the price of which shall be entered in a book, to be kept by an officer of the committee, through whom all sales must be made. A commission of 5 per cent. will be charged by the committee.
4. Purchasers must, in all cases, pay a deposit of 15 per cent. on the purchase of any work of art to the officer in charge, and shall pay the remainder of the purchase-money, and, at their own expense, remove the work so purchased, within ten days from the final close of the Exhibition. A work of art will not be considered sold, nor marked sold, until the deposit has been paid.
5. In case any purchaser shall not pay the remainder of the purchase-money within the period prescribed, the deposit shall be forfeited, and may, at the option of the committee, be given to the exhibitor of the work of art in question.
6. At the close of the Exhibition permanent galleries for pictures, &c., will be formed, and artists and others may leave their works on view, subject to the foregoing rules.

## DECISIONS SPECIALLY APPLICABLE TO MACHINERY IN MOTION.

## CLASS B.

1. The machinery will be grouped together as much as possible, to keep the noisy and dusty processes isolated.
2. The machinery must be kept at work, or in motion, during such hours as the Exhibition shall be open; the officers of the committee will put such machinery to work as may be standing without good cause, at the exhibitor's risk. Engineers' tools, &c., may be driven at a slow rate off the naked shafts.
3. Motive power will be provided as follows:—

A.—Lines of polished lying shafts, revolving 150 times per minute, 2½ inches diameter (Whitworth's standard gauge). Diameter of largest pulley admissible, 36 inches; all pulleys and wheels of any kind to be put on in halves, either to clamp on shaft, or to key on with hollow keys. Counter or cross shafts must be provided by exhibitors; belt guards or hooks must be provided as required by the Factory Acts, wherever, in the judgment of the committee, the public safety requires it.

B.—Steam at 50 lb. pressure, per square inch, in boiler, will be provided; and a range of steam and exhaust pipes laid through the building. Exhibitors must make their own connexions with these in a manner approved by the committee; no escape of steam into the building will be permitted.

C.—A limited supply of water, under a pressure of 70 feet, a larger supply under 22 feet, will be provided when the fountains are not in full play. An unlimited supply of water, about 10 feet below the floor, will be available, provided it is returned to the reservoir again.

Exhibitors must make their own connexions to the reservoir and water pipes in a manner approved by the committee.

4. Exhibitors must fence their machinery neatly and securely, in accordance with the regulations of the Factory Acts, as the committee cannot be responsible for accidents arising from neglect of these precautions.
5. Exhibitors must clean and lubricate their own machinery and counter-shafts, and provide their own hands. Shaft-ladders and belt crutches will be found by the committee.
6. Articles of great size or weight, the placing of which will require considerable labour, must be sent before the 1st of March, 1865; and manufacturers wishing to exhibit machinery, or other objects that will require foundations, must make a declaration to that effect on their demands for space.

By order,

HENRY PARKINSON, Secretary and Comptroller.

In July, 1864, the Committee issued, very extensively, the following circular:—

“Exhibition Palace, Dublin, July, 1864.

“Sir,

“The International Exhibition Committee are anxious to ascertain, at the earliest possible date, the amount of space that the manufacturers and other producers of Great Britain are likely to occupy in the Exhibition of 1865.

“As you were an exhibitor in 1862, and may probably desire to take part in the approaching Exhibition, I am directed to forward the accompanying form of demand for space; and if you wish to exhibit on this occasion I have to request that you will be so good as to fill up the enclosed form, and return it to me not later than 1st of September next. The applications so returned will be considered by the International Exhibition Committee, in their allotment of space. I enclose a copy of the decisions at which the committee have arrived up to the present date, on points relating to exhibitors.

“I have the honour to be, Sir,

“Your obedient servant,

“HENRY PARKINSON, Secretary and Comptroller.”

### MEETING AT THE MANSION HOUSE.

In the end of July the following invitation was sent out by Mr. P. P. M'Swiney, the then Lord Mayor:—

“Mansion House, Dublin, 30th July, 1864.

“The Lord Mayor presents his compliments to and requests the honour of his attendance at a meeting of the Committees of Advice for the Dublin International Exhibition, 1865, at the Mansion House, Dublin, on Friday, 5th day of August next, at half-past three o'clock.”

The meeting thus called was numerous and influentially attended. Amongst those present were:—Mr. T. M. Gresham, the Earl of Meath, Judge Berwick, Viscount Powerscourt, General Colomb, Mr. Benjamin Lee Guinness, Sir Bernard Burke, Mr. Davies, Mr. Kirk, Alderman Atkinson, Mr. Vance, Hon. J. P. Vereker, Sir George Hodson, Mr. Fry, Mr. Gilbert Sanders, Mr. Walker, Mr. Leslie, Sir Thomas Deane, Mr. Beete Jukes, Mr. Darley, Sir Robert Kane, Mr. Doyle, Sir Robert Shaw, Alderman Moylan, Dr. Cameron, Mr. Brunner, Alderman Hudson, Mr. Foot, Mr. Pim, Mr. Catterson Smith, Mr. George F. Mulvany, Mr. Jacob Owen, Mr. J. Lentaigue, Captain Roberts, Sir R. Griffith, Mr. W. Dargan, &c.

At half-past three o'clock the chair was taken by the Right Hon. the Lord Mayor, who, in opening the proceedings, said:—I feel extremely obliged and complimented by being called upon to preside at this very influential and numerous meeting. I am also pleased to have an opportunity of stating how heartily I concur in the views and objects of the Winter Palace Committee, who are desirous of raising in our city a magnificent building, and a building which, judging from its external proportions, will give ample accommodation to the citizens, and afford much-needed facilities for refined and intellectual enjoyment. It is gratifying to find that the efforts of the Industrial Committee, in connexion with the society in Kildare-street, have been crowned with eminent success. It is certainly an agreeable and hopeful matter for us, who are interested in the welfare of the new Industrial Palace, to find that the Royal Dublin Society have so far been successful in their efforts to raise the industrial character of our country. I am very sure that all that is needed on the present occasion is that the gentlemen outside the Executive Committee should give the necessary co-operation and support now requisite, because it is a work in which all must feel deeply interested who have the happiness and prosperity of Ireland at heart. The forthcoming Exhibition will afford a means by which all classes of citizens can receive instruction as well as enjoyment. It will also enable the public to form a correct estimate of what can be achieved in Ireland, and to derive instruction by studying the specimens of art and manufactures which they hoped to obtain from France, Germany, Austria, and other countries. These, I believe, are the objects the Executive Committee propose to achieve, which some of the gentlemen connected with that committee now present will detail more fully. My duty as chairman is simply to introduce to you the gentlemen who have favoured me with their presence on this occasion, who will take such counsel and advice as are best calculated to promote the great object which we all have at heart, namely, the good of our common country. I will be most happy to hear any suggestions which may be offered, and I believe the Secretary is prepared to communicate the result of the numerous circulars which have been sent out on the subject.

Mr. Parkinson (Secretary to the Exhibition Committee), having read a letter of apology from His Grace the Duke of Leinster, said that the result of the circulars sent out had been most satisfactory. The refusals had been very few. Those to whom circulars had been sent expressed their utmost readiness to give every assistance in their power.

Mr. Benjamin Lee Guinness, on rising to propose the first resolution, was received with loud applause. “That as the principle of International Exhibitions, first introduced by His late Royal Highness the Prince Consort in 1851, and so nobly followed up in Ireland by the public spirit of Mr. Wm. Dargan, eleven years since, has been productive of so much benefit to trade and commerce and improvement of the public taste; Resolved—The International Exhibition of

1865 is cordially deserving of support, and that we further it by every means in our power." I believe, my Lord, that none in this room and few beyond its walls entertain any doubt as to the great advantage of these international exhibitions. They were first introduced, as here remarked, by a lamented Prince, whose capacious mind and practical philanthropic heart were always directed and devoted to objects for the benefit of the country which he had adopted. The success of the Exhibition over which he presided is patent to everyone. It is known to have given an impetus to the Commerce, Fine Arts, and Manufactures of every country. I think the object of an International Exhibition is one of great importance, for it enables one country to see the perfection which another has attained in some particular branch of art and manufacture. In that way it spreads instruction; and it is easy to suppose that in many countries where they thought they had attained in some particular department of art a very considerable amount of experience and skill, when they see what other nations have done, they find that they are far behind what they may yet still accomplish. The usefulness of International exhibitions, therefore, cannot be doubted. This resolution also alludes to the successful results of an exhibition promoted by our distinguished countryman, Mr. William Dargan, whom we all honour and admire. Few who have the results of that exhibition before them can doubt for a moment the immense advantage which Ireland derived from it. There is another benefit also arising from international exhibitions. They bring us in contact with people from other countries, and the more we forget the insular feelings, which have so long existed in this country, the more they are sunk in oblivion, and the more we become citizens of the world, so much the better will it be for us, and so much the more prosperous will this country become. This resolution would commit the meeting to an opinion that the forthcoming Exhibition deserves the support of the public, and that we further it by every means in our power. The Dublin Exhibition Palace Company, as your Lordship is aware, are willing to give the building over for the purpose, and I, in common with many others connected with that project, regard it as a most suitable opportunity for opening an Exhibition in Dublin. Your Lordship alluded to the exhibition in Kildare-street, which has been so successful. That in itself is an encouraging fact, and I have no doubt if the new exhibition is opened with *eclat* and public spirit, and supported by persons able to forward its views, it will be a very great advantage, not only to the citizens of Dublin, but the country at large, and I trust even to the sister island.

The Earl of Meath—I have been called on to second that resolution, and I do so with pleasure. I have attended here to-day as one of the public with the view of giving the project every assistance that I as an individual can, and which I think every person ought to do in his own sphere. We ought to be exceedingly thankful to the members of the Exhibition Palace Committee who have erected so splendid a building in our city, which will afford to the citizens of Dublin, at every leisure moment they have, not only recreation but instruction. I attended here to-day to learn what were the views of these gentlemen, and to assist them in carrying them on to the utmost extent of my power. I think they have adopted a prudent course in first devoting their building to the purposes of an International Exhibition. They have my most hearty wishes for success, and if in an humble sphere I can hereafter advance their interests, they will always find me a ready instrument in their hands.

The resolution was then put from the chair and carried *nem. dis.*

Viscount Powerscourt on rising to propose the next resolution was received with loud applause. He said:—My lords and gentlemen, in establishing so large an affair as the present Exhibition in this country, it is necessary that committees of advice in the different departments should be formed, and I therefore beg to move the resolution which is intrusted to me:—"That committees of advice be appointed for the various classes into which the Exhibition is to be divided."

Mr. Gilbert Sanders, as Chairman of the Executive Committee, seconded the resolution. He wished to state to the meeting what steps had been already taken, and what success had been attained in respect of the International Exhibition. He had much pleasure in stating that they had much to hope for. He had, in conjunction with Mr. H. M'Donnell, who was at present in Paris, opportunities of testing the feelings of various contributors, who were engaged in the Exhibition of 1862 in London and Paris, who assisted on the part of the French Government. They also had introductions to some of the leading people in Paris, amongst others the French Minister of Commerce, to whom they detailed the objects which they had in view, and laid before him a prospectus of the Exhibition. He in the most cordial manner promised to give the project every support. That promise was subsequently fulfilled by the sending over here M. De Franqueville, the gentleman who acted as Secretary to the French Commissioner, M. Le Play, in 1862. He was sent over here to confer with us, and ascertain the extent to which we could accommodate the French people in the Exhibition. He (Mr. Sanders) looked on the immediate action of the French Minister of Commerce in the matter as an evidence of the interest taken by the French Government in the Exhibition. Similar success had attended

the negotiations at Brussels, and the Belgians promised to give every assistance. They trusted the Germans would aid them also. With respect to Austria there was no doubt but she would contribute largely; and when they had regard to the important part Austria took in the Great Exhibition of 1862, they might also expect much from her in the forthcoming Exhibition. They had reason to believe that the French people would take more than the usual interest in the project. Prince Napoleon expressed a desire not only to patronize it, but to accept the office of President of the Foreign Department, and if circumstances permitted he would visit this country at the opening of the Exhibition. In London, he was glad to say, they received the utmost assistance from the promoters of the Exhibition of 1862. From her Majesty's Government they also received much assistance. The Foreign Office had sent 100 circulars to the representatives of the British Government abroad, authorizing them to render all possible aid to the Exhibition, and similar letters were sent to the Colonies. Mr. Sanders read a letter from the Secretary at the Foreign Office to this effect. That was certainly as much as they could reasonably expect. They had also succeeded in obtaining permission from the Board of Customs to enable exhibitors to deliver their goods direct at the Exhibition building. That was an important concession, which would induce many persons to become exhibitors who might not otherwise be so disposed. The Lord Mayor had called his attention to an article on the subject of the Exhibition which it would be necessary for him to explain to the meeting, and show the error into which the writer had fallen. It was stated therein to be the intention of the committee to introduce sales at a commission of five per cent., and that by doing so they would interfere with the general trade of the city. As chairman of the Executive Committee he begged to give that statement the most unqualified denial. It was scarcely necessary to do so when it was remembered the gentlemen who constituted the committee would be themselves the most seriously injured by doing so. As regarded the fine arts, he believed it was customary to charge a percentage on the sale of pictures—five per cent. That was practised for a long period, and it was true that, so far as the fine arts were concerned, the Executive Committee had followed in the steps of former committees of exhibitions, and would afford artists an opportunity of selling their pictures; but so far as regarded trade and commerce they had not the slightest intention of interfering with it. On the contrary, their object was to assist their fellow-citizens in trade. He thought it right to make this explanation lest the statement might lead to a misapprehension of their intentions. The object of the several committees was to afford advice and assistance to the Executive Committee in the refusal or acceptance of the various articles offered for exhibition. There was no doubt, from the names of the gentlemen on the several committees they would be most efficient and satisfactory.

The resolution was then put and unanimously adopted.

Mr. William Dargan moved that the following lords and gentlemen be appointed committees of advice and assistance:—

#### CLASS A—RAW MATERIALS.

1. Mining, quarrying, metallurgical operations, and mineral products; 2. Chemical and pharmaceutical Processes and products generally; 3. Substances used as food; 4. Vegetable and animal substances chiefly used in manufacture as implements or for ornament.

Lord Anally; Sir R. Kane, F.R.S.; Professor Jukes, F.R.S.; Professor Apjohn, F.R.S.; Professor Harvey, F.R.S.; John Ball Greene, Esq., C.E.; G. W. Maunsell, Esq., J.P.; Laurence Waldron, Esq.; Sir Edward Grogan, Bart.; Colonel Taylor, M.P.; Right Hon. James Whiteside, M.P.; Charles Cobbe, Esq., D.L.; Val. O'B. O'Connor, Esq., D.L.; Charles William Hamilton, Esq., J.P.; Professor Allman; Right. Hon. Joseph Napier; Sir James Power, Bart.; W. K. Sullivan, Esq., Ph.D.; Sir David Brewster, K.H., F.R.S.; The Right Hon. John Barrington, Lord Mayor; F. Codd, Esq., J.P.; A. H. Bagot, Esq.; Edward Hudson Kinahan, Esq.; J. T. Wigham, Esq.; Professor Cameron, M.D.

#### CLASS B—MACHINERY.

5. Machines for direct use, including carriages and Railway and naval mechanism; 6. Manufacturing machines and tools; 7. Civil engineering, architectural, and building contrivances; 8. Naval architecture and military engineering, ordnance, armour, and accoutrements; 9. Agricultural and horticultural machines and implements; 10. Philosophical instruments and processes depending upon their use; Photographic apparatus, musical, horological and surgical instruments; Machinery employed in spinning and weaving, and in the manufacture of wood and metal; machinery in general.

Earl of Rosse, F.R.S.; Earl of Clancarty, Earl of Lucan, Lord Otho Fitzgerald, M.P.; Sir R. Griffith, Bart.; Major-General Sir Thomas Larcom, K.C.B.; Sir Robert Shaw, Bart., D.L.; Vice-Provost Lloyd, F.R.S.; Rev. T. Romney Robinson, F.R.S.; William R. Le Fanu, Esq., C.E.; J. Tufnell, Esq., M.D., F.R.C.S.I.; Richard Butcher, Esq., M.D., F.R.C.S.I.; George W. Hatchell, Esq., M.D., F.R.C.S.I.; B. B. Stoney, Esq., C.E.; R. C. Wade, Esq.; Professor Downing, T.C.D.; Captain Needham; Francis Robinson, Esq., Mus. Doc.; J. F. Elrington, Esq., LL.D.; Sir Percy Nugent, Bart.; Captain Esmonde, M.P.; Captain Thornhill, J.P.; Captain Pollock; the Knight of Kerry; P. Riall, Esq., J.P.; Rev. J. H. Jellet, F.T.C.D.; Thomas Grubb, Esq.; George Alexander Stephens, Esq.; Fielding Scovell, Esq.; Charles P. Cotton, Esq., C.E.; R. Galloway, Esq.; Joseph Maguire, Esq.; Parke Neville, Esq.; T. Maxwell Hutton, Esq.; S. Wilfred Haughton, Esq.; John A. Walker, Esq.; and Thomas Martin, Esq.

ARMY.—Field Marshal Lord Viscount Gough; the Deputy Adjutant-General; the Deputy Quartermaster-General; the Military Secretary; Colonel Durnford, R.E.; Colonel M'Kerlie, R.E.; Colonel M'Causland, R.E. Colonel Buchanan, R.A.

NAVY.—Sir James Dombrain ; Captain De Courcy, R.N. ; Captain Wilcox, R.N. ; Captain Roberts, R.N. ; J. Laird, Esq., M.P. ; J. Good, Esq. ; W. H. Webb, Esq. ; E. H. Harland, Esq.

#### CLASS C—TEXTILE FABRICS.

11. Cotton ; 12. Woollen and worsted ; 13. Silk and velvet ; 14. Manufactures from flax and hemp ; 15. Mixed Fabrics, including shawls, but exclusive of worsted goods (Sec. 12) ; 16. Leather, including saddlery and harness, skins, furs, feathers, and hair ; 17. Paper and stationery, printing and bookbinding ; 18. Woven, spun, felted, and laid fabrics, when shown as specimens of printing or dyeing ; 19. Tapestry, including carpets and floor-cloths, lace and embroidery, fancy and industrial works ; 20. Articles of clothing for immediate personal or domestic use.

William Aitkin, Esq. ; Thomas C. Scott, Esq. ; Orlando Beater, Esq. ; Alexander Parker, Esq., J.P. ; W. Jury, Esq. ; E. Purdon, Esq., T.C. ; W. Graham, Esq., T.C. ; George Alexander Stephens, Esq. ; John Fry, Esq. ; the Right Hon. the Lord Mayor ; George Delany, Esq. ; R. G. Collis, Esq. ; Alderman Atkinson, J.P. ; Thomas Pim, Esq. ; Captain C. Vesey ; Maxiere Brady, Esq. ; Thomas K. Austin, Esq. ; J. W. Switzer, Esq. ; John A. Walker, Esq.

#### CLASS D—METALLIC, VITREOUS, AND CERAMIC MANUFACTURES.

21. Cutlery and edge tools ; 22. Iron and general hardware ; 23. Working in precious metals, and in their imitation, jewellery and all other articles of vertu and luxury not included in other classes ; 24. Glass ; 25. Ceramic manufacture, china, porcelain, earthenware, &c. ; 25<sup>a</sup> Antiquities—relics of ancient art in stone, woods, metals, and other substances, with rubbings from monuments.

The Earl of Howth ; The Earl of Meath ; Viscount Dunlo ; Lord St. Lawrence ; David M'Birney, Esq., J.P. ; J. Lentaigue, Esq., J.P. ; The Hon. George Handcock ; John Vance, Esq., M.P. ; I. T. Hamilton, Esq., M.P. ; Charles E. Bagot, Esq. ; Lord James Wandesford Butler ; J. West, Esq., J.P. ; J. E. Vernon, Esq., D.L. ; Anthony Lefroy, Esq., M.P. ; Right Hon. Justice O'Hagan ; R. J. T. Macrory, Esq. ; The Hon. St. John Butler, and Percy Fitzgerald, Esq.

#### CLASS E—MISCELLANEOUS MANUFACTURES.

26. Decoration, furniture, upholstery, including paper hangings, papier maché, and japanned goods ; 27. Manufactures in mineral substances used for building or decoration, as in marble, slate, porphyries, cements, artificial stones, &c. ; 28. Manufactures from animal and vegetable substances, not woven or felted, or included in other sections ; 29. Miscellaneous manufactures and small wares.

Viscount Southwell ; Sir Robert Kane, F.R.S. ; James Forrest, Esq. ; Sir R. Griffith, Bart. ; A. H. Bagot, Esq. ; R. G. Collis, Esq., J.P. ; Alderman Atkinson, J.P. ; Arthur Edward Guinness, Esq. ; Samuel Law, Esq. ; Hugh Brown, Esq. ; Sir Robert Shaw, Bart. ; Walter Lindsay, Esq., J.P. ; John Hatchell, Esq. ; The Attorney-General, M.P. ; John Henry Richards, Esq. ; Arthur Usher, Esq., J.P. ; Jonathan Pinn, Esq. ; H. T. Vickers, Esq. ; and Henry L. Fry, Esq.

#### CLASS F—FINE ARTS.

30. Paintings in oil and water colours, drawings and photographs, architecture, sculpture, models, and plastic art, die-sinking and intaglio, engravings and etchings, enamels and frescoes.

The Right Hon. the Lord Chancellor ; Marquis of Drogheda ; Marquis of Kildare ; Earl of Charlemont ; Viscount Powerscourt ; Viscount Southwell ; Lord Talbot de Malahide, F.R.S. ; Sir George F. J. Hodson, Bart., D.L. ; The Right Hon. Sir Robert Peel, Bart., M.P. ; Hon. Judge Berwick ; Sir J. Bernard Burke ; Sir J. J. Coghill, Bart. ; J. E. V. Vernon, Esq., D.L. ; Sir Charles Eastlake, P.R.A. ; Catterson Smith, Esq., P.R.H.A. ; G. F. Mulvany, Esq., R.H.A., Director of the National Gallery, Ireland ; Thomas A. Jones, Esq., R.H.A. ; J. R. Kirk, Esq., R.H.A. ; M. Angelo Hayes, Esq., R.H.A. ; Major-General Colomb ; Walter Creyke, Esq. ; Jacob Owen, Esq. ; Francis R. Davies, Esq., M.R.I.A. ; S. C. Hall, Esq. ; Right Hon. Alexander MacDonnell ; Sir Thomas Deane, R.H.A. ; Sir John Benson ; Richard Redgrave, Esq., R.A. ; Daniel Maclise, Esq., R.A. ; William Cotter Kyle, Esq., LL.D. ; John H. Foley, Esq., R.A. ; P. MacDowell, Esq., R.A. ; F. W. Burton, Esq., R.H.A. ; Thomas Agnew, Jun., Esq. ; President of the Society of British Artists ; President of the Society of Painters in Water-colours ; President of the Institute of Paintings in Water-colours ; President of the Royal Scottish Academy ; Wm. B. Johnstone, Esq., R.S.A., National Gallery of Scotland ; President of the Institute of Architects, England ; President of the Institute of Architects, Ireland ; William M'Kay, Esq.

Sir George Hodson seconded the resolution. He felt assured every gentleman solicited would do his utmost to promote so useful an undertaking.\*

Mr. Andrew Bagot wished to ask a question before the resolution was put—namely, whether it was yet determined to have a classification of goods from different countries, and also whether the appointment of the committees should be considered as definite ?

Mr. Sanders said that Mr. Bagot put a question which he was not prepared to answer, as it involved considerations which were rather premature. It should be understood, however, that they had not by any means closed their committee lists, as they hoped many noblemen and gentlemen who had served on the committees of 1862 would act.

\* A sub-committee for Class B, Section 9, was subsequently added, composed of the following noblemen and gentlemen :—

Sir Richard Griffith, Bart. ; Viscount Dunlo ; George Woods Maunsell, Esq., J.P. ; P. Riall, Esq., J.P. ; Captain Thornhill, J.P. ; David Drummond, Esq. ; William Edward Steele, Esq., M.D. ; Parke Neville, Esq., C.E. ; Robert Collins, Esq., M.D. ; C. C. Vesey, Esq., J.P. ; Mr. Andrew Corrigan, Superintendent.

The sub-committee had under its special care agricultural and horticultural machines and implements, artificial manures, and all other matters connected with agriculture. This department of the Exhibition occupied the Agricultural Hall of the Royal Dublin Society.

Mr. Bagot observed that he would be most happy to lend his assistance in the department of Irish manufactures. His experience for the last two years brought him intimately in connexion with the manufacturers of the country. He believed such exhibitions of industry were more required here than in any other country in Europe.

General Colomb said that in the nomination of the committee for the army he did not hear the name of the Adjutant-General mentioned. He thought he should be nominated as he was the organ of the army in Ireland.

The Lord Mayor said that any gentleman who thought right to change from one committee to another might reasonably do so, particularly if he thought he could afford more benefit to the project.

The resolution was then put and carried *nem. dis.*

The Hon. Judge Berwick proposed the following resolution:—"That the committees do meet at the office of the Exhibition at such times as they may find necessary, and commence their meetings at as early a date as convenient." His Lordship said—It will be unnecessary for me to say one word with respect to that, for I presume it will follow as a matter of course; but as I have been honoured by having this resolution placed in my hands, I may just say this, that from the very moment I received your lordship's invitation to take part in this national Exhibition, I did not hesitate one moment in writing to say that, as far as my humble efforts could assist in it, I would be most willing to give all the assistance in my power. My friends will admit that I have done my best on two or three exhibitions already, and took the only part in which I really could give assistance, and that is the department of the arts; and I am inclined to think that my services have not been quite without their reward in the recent Exhibition. I am much obliged to you and the other gentlemen for putting my name on the committee of the fine arts, and all I shall do is to promise that the very best assistance I can give to stimulate that portion of the business of this International Exhibition I shall most enthusiastically give as far as my time will permit. I have taken up that subject on several grounds. First of all, to my knowledge, there is in this country an amount of talent in young Irish artists which, I believe, if they got fair play, and the assistance that is absolutely necessary to bring forward young men who are engaged in the fine arts, would make the name of this country distinguished; and I do so on another ground, because as yet I do not think there has been in Ireland that support and encouragement to the fine arts that the great body of talent that is in this country to my knowledge deserves. Already I can see that the assistance afforded by the different exhibitions that have taken place in this country in the department of the fine arts, commencing with that most noble exhibition commenced by Mr. Dargan, has done a great deal of good in drawing the attention of Ireland and of Irishmen to the encouragement of the fine arts. And I have no doubt that the exhibition which is about to take place next year will, with the assistance of those noblemen and gentlemen whose names are put on that committee, have a great effect in drawing the attention of the public to the fine arts, encouraging them in laying out their money; and without a body who are willing and ready to lay out money in the fine arts, the most distinguished artists in the world cannot be brought forward so as to distinguish the country to which they belong. Art, unfortunately, in Ireland, is as yet only in its commencement, but I hope and believe it will get a stimulus now that will turn the attention of Irishmen and Irishwomen to the encouragement of the arts in their own country. In England it has already reached the climax that every work of art commands a price which pays the artist in such a manner as to place him in a high and distinguished position, and I trust the time is not far distant when the same thing will take place in Ireland; for I firmly believe that there are men in Ireland now who have turned their attention to the fine arts, whose names will be handed down to posterity as persons worthy of the country to which they belong.

Sir Bernard Burke seconded the resolution, and said he was sure that if each one of them in his individual capacity would do his utmost the Exhibition of 1865 would rival the Exhibition of London in 1862—memorable not only for the encouragement it would give to the fine arts, but memorable also for the crowds of foreigners—Englishmen, Frenchmen, Italians, Germans, and others who would congregate in our streets.

The resolution was put and carried.

Sir Thomas Deane said he felt great honour in proposing the resolution which had been placed in his hands:—"That the Lord Mayor be requested to assist the Executive Committee by inviting the co-operation of the municipal bodies in the United Kingdom." As many speakers had preceded him, they left scarcely a word for him to say, but it would be unusual for an Irishman to be quiet on an occasion like the present. He would first congratulate them on that meeting, which augured well—a meeting consisting of rank and talent—a meeting the influence of which would be felt hereafter not only in this country, but in England and on the continent. It was a meeting that would keep green in their memories the man from whose mind had emanated these great things—the late lamented Prince Consort. It must also be grateful to them

to have the support of his brave widow. This great Exhibition would be patronized not only by this but all other countries, and would induce the artists of England and the continent to exhibit their works. Sir Thomas Deane then referred to the exhibition in Cork, which had been the first of the kind held in Ireland, and said he would be ready to give his aid, humble as it was, to the raising of what would be a perpetual source of enjoyment to this country in the Winter Palace—a beautiful continuation of what had been so ably begun.

Mr. Pim seconded the motion, which was passed unanimously.

Sir Robert Kane proposed the next resolution:—"That the co-operation of artists and manufacturers is solicited in the United Kingdom, in foreign countries, and the colonies." It was unnecessary to explain to the meeting the absolute necessity of seeking this co-operation; for, of course, unless they could succeed in obtaining it, the materials for the exhibition would not come to hand. It was therefore important for the committees to place themselves under such circumstances as that manufacturers and artists should feel confidence that the objects they might send for exhibition would have every opportunity afforded of their qualities being fully observed and appreciated by the public. With such an Executive Committee as that which had already been organized he had no doubt that the manufacturers and artists would have the most perfect confidence, and would readily afford the co-operation desired. There was one point, which he would not call a little one, for it was really important in connexion with the manufactures. It should be arranged that the merits of the workmen might be recognized, and that the actual producer of the manufactures and articles exhibited should be known in the distribution and award of prizes, as well as the mere capitalists who supplied the means for their production. There had been a broad line of distinction between the exhibitions which had latterly taken place in London and those which had been almost simultaneously carried out in the continental countries. The recognition of the genius and the services of the good workman—of every workman—had been a main feature in the management, and a main element in the success, of those continental exhibitions. In the exhibitions in England the manufacturers alone were regarded in the distribution of the prizes, but he hoped in the arrangements which it would be the duty of the Executive Committee and other committees to carry out with regard to this exhibition, the workman—the true artificer—no matter whether Irish or foreign, rich or poor, would have his merits fully recognised, and honour paid to him, as well as the man of millions, who merely threw his large capital into the manufacturing system, looking simply to the money return. He had listened with great interest and pleasure indeed to the opinions expressed by Judge Berwick with regard to the necessity for a more extended and remunerative patronage of the fine arts in this country. He entirely concurred in what his Lordship and Sir Thomas Deane had said; but he would suggest that that very patronage would in itself be the natural and almost inevitable result of a more practical and manufacturing spirit amongst the people of this country. If they looked to those places which had been the theatres of great success in arts; if they looked to the great schools of painting which had arisen in Venice, Florence, and Genoa, they would find that those great triumphs of art which we now regarded as the greatest ornaments of our national galleries had been produced under the influence and by the enlightened patronage of successful merchants and manufacturers. If Venice had produced Titian and Tintoretto, it was because Venice was the emporium of the world. If Florence had produced great schools of painting, it was because the Medici rose from being apothecaries to the position of merchants, and from that to princes. So it was the influence of liberal patronage which had developed the talents of its artists. Artists sought remunerative employment, and that would come when the community had earned by manufacturing and industrial pursuits. The means of employing them at the present moment—the remunerative power which existed in Great Britain for artistic skill, to which Judge Berwick had so very properly alluded, was such that no sooner was a good picture produced than it was eagerly sought after, and a good price paid for it. Those good prices were paid by the merchants and manufacturers. It was well known that the great mart for the fine arts was in the manufacturing districts of Great Britain. In the coming International Exhibition they would happily unite the æsthetic element with the more practical element, which was to give them the means of paying for it. Sir Robert Kane concluded by again impressing on the meeting the necessity and justice of recognising not merely the employer in the merits of the manufactured articles, but also the good workman who produced them.

Major-General Colomb felt great pleasure in seconding the resolution. The manufacturer and the workman were not independent of each other, but were dependent.

The resolution was carried unanimously.

The Hon. Mr. Vereker felt great pleasure in moving "That the thanks of the Executive Committee be given to the gentlemen who had kindly undertaken to act on the Committees of Advice." In moving that resolution he would only say that he thought the Executive Committee had shown their anxious desire not to monopolize any patronage, or any little power they might possess, but to place this undertaking on the broadest basis—the basis of the people—as it

was a broad, great, and national undertaking. He might also congratulate the Lord Mayor on another incident which had occurred that day, the fact that his lordship had been selected as the head of all Irish municipalities, and the second municipal officer of the United Kingdom, to invite the co-operation of the various municipal bodies with the Executive Committee. He was sure his efforts would meet with the warmest success, and while it would place his lordship in the proper position he ought to occupy, it would attract a great deal of patronage, and give much encouragement to the undertaking.

Mr. F. W. Brady, Q.C., said, as a member of the Executive Committee, he could fully appreciate the force of the resolution he was about to second. As soon as their labours commenced they felt at once that the assistance and co-operation of gentlemen conversant with the various branches into which the Exhibition was to be divided, would be essential, and they considered how that was best to be obtained. They had followed in this as in all their steps, the precedent set at the Exhibitions of 1851 and 1862, and they solicited, as had been done on that occasion, the co-operation of a number of other gentlemen. He was delighted, indeed, to have seen that solicitation so warmly responded to as it had been that day, and it argued very well indeed for the ultimate success of the undertaking. He could tell the gentlemen who had undertaken to act on the various committees that they had before them no light task. It would not be a mere matter of form their allowing their names to be placed upon the committees. They had before them—not that he wished to frighten them in any way—a very great deal to do. It would be for each committee taking charge of a section of the Exhibition, to ascertain what were the objects of art and manufacture most attractive and useful to be collected for that department; where those were who had them, how they were to be obtained, and to follow up those inquiries by taking the requisite steps to bring them to Dublin and have them exhibited. The committees of advice would, therefore, have before them a work important and useful in proportion to the energy and activity which they devoted to it. As a member of the Executive Committee, having a good deal of knowledge of the preparations already made, he took the opportunity of making those few observations.

The resolution was put and carried unanimously.

On the motion of Alderman Atkinson the chair was then vacated by the Lord Mayor, and taken by the Earl of Meath.

Sir Robert Shaw said he felt great pleasure in proposing the thanks of the meeting to the Lord Mayor for his honourable and dignified conduct in the chair, and for his having called that influential meeting to assist in working out an Exhibition which, in the year 1865, would almost rival those lately held in the sister country. In one respect this Exhibition would have an advantage over those which they had already seen, for it would be the opening of a grand Exhibition Palace which was not to be pulled down as soon as the Exhibition was over, but which, it was hoped, would be a place that would exist for centuries as a memorial of the Exhibition, and a place of recreation to the citizens of Dublin.

Sir Richard Griffith seconded the resolution, and expressed his conviction that the Exhibition would be a great success.

The noble chairman, in putting the motion, said it was a pleasing duty to him to give the meeting an opportunity of expressing their cordial thanks to the Lord Mayor for having performed the duties of chairman in so dignified and pleasing a manner.

The motion was carried unanimously.

The Lord Mayor acknowledged the vote of thanks, and said that in every way that he could be instrumental in promoting the success of the Exhibition he would be happy to co-operate with the committee, as he felt it was the duty of the Chief Magistrate to do all that lay in his power to promote the growth of Art and Manufactures in Ireland. (Hear, hear.) The meeting then separated.

Within a short period, the newly-appointed Committees of Advice held preliminary meetings at which the following honorary appointments were made:—

**CLASS A—RAW MATERIALS.**—Professor Cameron, M.D., Hon. Sec.

**CLASS B—MACHINERY.**—John A. Walker, Esq.; Thomas Martin, Esq., Hon. Secs.

**CLASS C—TEXTILE FABRICS.**—John A. Walker, Esq., Hon. Sec.

**CLASS D—METALLIC VITREOUS, AND CERAMIC MANUFACTURES.**—The Hon. St. John Butler, Percy Fitzgerald, Esq., Hon. Secs.

**CLASS E—MISCELLANEOUS MANUFACTURES.**—Henry L. Fry, Esq., Hon. Sec.

**CLASS F—FINE ARTS.**—Viscount Powerscourt, Chairman; William M'Kay, Esq., LL.D., Hon. Sec.

**NOTE.**—Sir J. J. Coghill, Bart., was appointed Honorary Director of the Photographic Department, and was assisted by Captain Close.

PROCEEDINGS OF THE LONDON COMMITTEE OF ADVICE.

A Committee of Advice was early formed in London from amongst the members of the Society of Arts, and those manufacturers and other gentlemen who had great experience in previous Exhibitions, and the following extracts from their minutes of proceedings will prove interesting :—

FRIDAY, 2ND SEPTEMBER, 1864.

The committee met at the house of the Society of Arts this day, at 4 o'clock.

Present :—W. HAWES, Esq., in the chair; J. ANDERSON, Esq.; R. K. BOWLEY, Esq.; ANTONIO BRADY, Esq.; GEO. GODWIN, Esq.; R. HUDSON, Esq.; P. C. OWEN, Esq.; Sir F. R. SANDFORD; J. WAY, Esq.; G. F. WILSON, Esq.; T. WINKWORTH, Esq.; and P. LE NEVE FOSTER, Esq., Hon. Sec.

F. W. BRADY, Esq., and H. PARKINSON, Esq., attended on behalf of the Dublin Executive Committee to explain the position and prospects of the Exhibition, and to request the formation of a London committee of advice to assist in the promotion of the undertaking.

The meeting was adjourned to Wednesday the 7th September.

WEDNESDAY, 7TH SEPTEMBER, 1864.

A meeting was held this day at 4 o'clock. Present :—

W. HAWES, Esq., in the chair; ANTONIO BRADY, Esq.; GEO. GODWIN, Esq.; R. HUDSON, Esq.; P. C. OWEN, Esq.; Sir C. P. RONEY; G. F. WILSON, Esq.; T. WINKWORTH, Esq.; M. DIGBY WYATT, Esq.; and P. LE NEVE FOSTER, Esq., Hon. Sec.

Present on behalf of the Dublin Exhibition Executive Committee, and on that of the Dublin Palace and Winter Garden Company (Limited) :—

Lord TALBOT DE MALAHIDE; GILBERT SANDERS, Esq.; F. W. BRADY, Esq., Q.C.; W. DARGAN, Esq.; T. M. GRESHAM, Esq.; and H. PARKINSON, Esq.

The following articles of agreement between the Dublin Exhibition Palace, &c., and the Executive Committee, &c., were submitted to the meeting :—

"Articles of agreement, dated the 7th day of September, 1864, between the Dublin Exhibition Palace and Winter Garden Company (Limited) and the Executive Committee of the Dublin International Exhibition for 1865.

"Whereas it has been resolved to hold an International Exhibition of Arts and Manufactures in Dublin in the year 1865.

"And whereas the following gentlemen are constituted the executive committee for carrying out the undertaking :—

GILBERT SANDERS, Esq., M.R.I.A., *Chairman*.  
FRANCIS WILLIAM BRADY, Esq., Q.C.  
MAURICE BROOKS, Esq.  
WM. DARGAN, Esq., D.L.  
DAVID DRUMMOND, Esq.  
WILLIAM FOOT, Esq., J.P.  
JOHN FRY, Esq.  
Sir RICHARD GRIFFITH, Bart.

Sir R. KANE, F.R.S.  
WILLIAM LE FANU, Esq., C.E.  
J. LENTAIGNE, Esq., D.L.  
THOMAS PIM, Esq.  
W. R. STEPHENS, Esq.  
JOHN W. SWITZER, Esq.  
THOMAS VANCE, Esq., J.P.

"And whereas the Dublin Exhibition Palace and Winter Garden Company (limited) have agreed to grant the use of their buildings, gardens, and premises for the purposes of the Exhibition, and otherwise to promote the same, as hereinafter provided.

"Now it is hereby agreed between the Dublin Exhibition Palace and Winter Garden Company (limited) and the executive committee of the Dublin International Exhibition for 1865, that the said company will grant the use of their said buildings, gardens, and premises to the said executive committee during such time as may be required for the Exhibition, and will likewise provide such further and additional buildings as may be agreed on by the parties hereto, and will provide the requisite funds for carrying on the Exhibition in all its details according to the wants and requirements of the said Executive Committee, upon the following terms—that is to say :—

"That the entire receipts of the Exhibition be applied as follows :—

"1. In payment of the officers, servants, and other persons connected with the Exhibition, and all other expenses attendant on the Exhibition, according to the directions of the said Executive Committee.

"2. In repayment of all the costs and expenses attendant on the said additional buildings and works, and of all moneys advanced by the said company for carrying on the said Exhibition.

"3. In payment to the said company of the sum of £15,000, as and for the use of the said buildings, and as compensation to the said company for the occupation of the same, and for interest on moneys advanced, and to cover any damage or wear and tear of the building during its occupation. And the surplus receipts after the payments aforesaid to be applied in such manner as the said Executive Committee and the following noblemen and gentlemen forming, with the said Executive Committee, a committee to be styled "the Exhibition Committee," may direct.

The LORD CHANCELLOR of Ireland  
 The DUKE OF LEINSTER  
 The EARL OF MEATH  
 The EARL OF CHARLEMONT  
 The EARL OF HOWTH  
 The EARL OF ROSSE  
 The MARQUIS OF DROGHEDA  
 The EARL OF CLANCARTY  
 The EARL OF LUCAN  
 VISCOUNT GOUGH  
 VISCOUNT POWERSCOURT  
 LORD TALBOT DE MALAHIDE  
 LORD ANALLY  
 LORD CLONCURRY  
 MARQUIS OF KILDARE  
 SIR ROBERT SHAW, Bart.  
 SIR EDWARD Grogan, Bart., M.P.  
 SIR PERCY NUGENT, Bart.  
 SIR J. J. COGHILL, Bart.  
 SIR RALPH HOWARD, Bart.

The Rt. Hon. P. P. M'SWINEY, Lord Mayor of Dublin  
 J. BARRINGTON, Esq., Lord Mayor Elect  
 SIR THOMAS DEANE  
 SIR BERNARD BUBKE, Ulster King-at-Arms  
 JUDGE BERWICK  
 Hon. ST. JOHN BUTLER  
 Hon. J. P. VERRER  
 Rt. Hon. ALEXANDER M'DONNELL  
 MAJOR-GENERAL COLOMB  
 The ATTORNEY-GENERAL for Ireland  
 The SOLICITOR-GENERAL for Ireland  
 J. E. V. VERNON, Esq., D.L.  
 B. L. GUINNESS, Esq., D.L.  
 WM. ANDREWS, Esq.  
 WM. M'KAY, Esq.  
 CATTERSON SMITH, Esq., P.R.H.A.  
 G. F. MULVANY, Esq., Director of the National Gallery,  
 Ireland  
 MAJOR-GENERAL SIR THOMAS LARCOM, K.C.B.

(Signed) T. M. GRESHAM,  
 On behalf of the Dublin Exhibition Palace and Winter Garden Company (Limited).

(Signed) GILBERT SANDERS,  
 On behalf of the Executive Committee for the International Exhibition of 1865.

Resolved :—That the explanation of the position and prospects of the Dublin International Exhibition for 1865, being considered satisfactory to this meeting, a committee of advice be formed in London to secure an adequate representation of our industries and manufactures, and to promote the interest of exhibitors.

That such committee consist of the following gentlemen, with power to add to their number :—

J. ANDERSON, Esq.  
 R. K. BOWLEY, Esq.  
 E. A. BOWRING, Esq., C.B.  
 ANTONIO BRADY, Esq.  
 Sir DAVID BREWSTER, F.R.S.  
 H. COLE, Esq., G.B.  
 Sir C. W. DILKE, Bart.  
 T. FAIRBAIRN, Esq.  
 J. H. FOLEY, Esq., R.A.  
 GEO. GODWIN, Esq., F.R.S.  
 G. GROVE, Esq.  
 W. HAWES, Esq.  
 R. HUDSON, Esq.  
 OWEN JONES, Esq.

C. MANBY, Esq., F.R.S.  
 P. C. OWEN, Esq.  
 Hon. B. F. PRIMROSE  
 S. REDGRAVE, Esq., R.A.  
 Sir C. P. RONEY  
 Sir F. R. SANDFORD  
 R. A. THOMPSON, Esq.  
 E. WATERTON, Esq.  
 J. WAY, Esq.  
 G. F. WILSON, Esq., F.R.S.  
 T. WINKWORTH, Esq.  
 M. DIGBY WYATT, Esq.  
 P. LE NEVE FOSTER, Esq., M.A., Hon. Sec.

That a report of this meeting be laid before the council of the Society of Arts, with a request to be allowed to use the house of the Society for transacting the business of the committee.

Mr. GILBERT SANDERS stated that the Executive Committee in Dublin would provide such funds as would be requisite for the necessary expenses of the London committee, and that for this purpose a preliminary sum of £200 would be placed to the credit of Mr. Foster, the Hon. Sec., at Messrs. Coutts' Bank.

Mr. SANDERS and Mr. BRADY also stated that the Executive Committee pledged themselves to procure an independent guarantee to insure the works of art and goods of Exhibitors from any liabilities of the company or of the Executive Committee.

Lord TALBOT DE MALAHIDE, in name of the Exhibition Committee, presented their thanks to the gentlemen constituting the London Committee of Advice for the readiness and cordiality with which they had come forward to promote the success of the Exhibition.

ROBERT HUDSON.

FRIDAY, SEPTEMBER 23RD, 1864.

The committee met this day at four o'clock. Present :—

R. HUDSON, Esq., in the chair : A. BRADY, Esq. ; S. C. HALL, Esq. ; P. C. OWEN, Esq. ; J. B. WARING, Esq. ; and H. S. WAY.

The minutes of the last meeting of the committee were read and confirmed.

The resolutions passed at the meeting of the council of the Society of Arts on Tuesday, the 13th instant, were read.

#### SOCIETY OF ARTS.

RESOLUTIONS PASSED AT A MEETING OF THE COUNCIL, HELD ON TUESDAY, SEPTEMBER 13TH, 1864.

"A committee of advice, formed in London for promoting the interests of the Dublin International Exhibition, having requested to be permitted the use of the Society's house for transacting the business of the committee, it was agreed to permit the committee to use the Society's house for such purposes, during the pleasure of the council."

The London Committee of Advice having requested the Society's secretary, Mr. Foster, to act as their Honorary Secretary, it was resolved that permission be given to him to act in that character, it being an instruction to him that in all papers issued from the house of the Society it be indicated that they are issued on behalf of the Dublin Exhibition, and that his signature is attached as the Honorary Secretary of that committee.

The council, in these arrangements, is happy to manifest its sympathy in the undertaking in which the Dublin Committee has embarked, but think it right, at the outset of their proceedings, to declare that their willing assent to the request made to them is not to involve the Society in any responsibility either pecuniary, or otherwise, in respect of the Exhibition.

A letter from Mr. Sanders, the Chairman of the Executive Committee, containing notice of the proceedings of the Executive Committee, was read.

112, Grafton-street, Dublin,  
14th September, 1864.

MY DEAR SIR,

The agreement, as approved of by the London Committee on the 7th instant, was confirmed by the general board yesterday without any alteration or amendment whatever, and the seal of the company was attached to it to-day.

The copy of the minutes of the Society of Arts, dated 13th September inst. as forwarded by you, was read to the committee to-day, and considered satisfactory.

The sum of £200 (two hundred pounds) was drawn for by the finance committee to-day, which will be forwarded to you, and your agreement, as soon as it can be passed through the necessary forms.

A form of guarantee conformable to the terms prepared on Wednesday last has been agreed to. As soon as it can be engrossed and signed by a sufficient number, it, or a copy of it, will be forwarded to you.

I remain, Dear Sir,

Yours most truly,

G. SANDERS.

P. LE NEVE FOSTER, Esq.,  
Society of Arts.

A circular to exhibitors being submitted to the committee was approved as amended.

The Honorary Secretary announced to the committee that the following noblemen and gentlemen had been invited, and had consented to act on the committee :—

LORD HENRY LENNOX, M.P. ; MESSRS. S. C. HALL, PETER GRAHAM, and J. B. WARING.

It was resolved to invite the following noblemen and gentlemen to allow their names to be added to the list of the London Committee of Advice :—

THE DUKE OF DEVONSHIRE ; the DUKE OF SUTHERLAND ; the EARL OF CAITHNESS ; LORD WHARFCLIFFE ; LORD STANLEY ; the LORD MAYOR ; Viscount HAWARDEN ; Sir J. EMERSON TENNENT ; Alderman ROSE, M.P. ; A. J. BERRSFORD HOPE, Esq. ; THOMAS BATTAM, Esq. ; Dr. J. FORBES WATSON ; F. W. FAIRHOLT, Esq.

Resolved :—"To advise the Executive Committee to arrange for the formation of a committee of advice, (similar to the one in London) for Scotland, either at Edinburgh or Glasgow."

The Honorary Secretary was directed to communicate with the chambers of commerce of the manufacturing towns in England, informing them of the establishment of the London Committee of Advice, and requesting their support and assistance in obtaining a proper representation of the trade and industry of their respective towns in the Exhibition.

Resolved :—"That the members of this committee will individually exert their personal interest and use their best endeavours to secure the co-operation of exhibitors."

"That until further notice this committee will meet every Friday, at 4 o'clock, at the House of the Society of Arts."

ROBERT HUDSON.

FRIDAY, 30TH SEPTEMBER, 1864.

The Committee met this day at 4 o'clock. Present :—

ROBERT HUDSON, Esq., in the chair ; S. C. HALL, Esq. ; GEO. GODWIN, Esq. ; T. BATTAM, Esq. ; H. S. WAY, Esq. ; THOMAS WINKWORTH, Esq. ; P. C. OWEN, Esq. ; G. GROVE, Esq.

The minutes of the last meeting were read and confirmed.

The committee was informed that in reply to their invitation the Lord Mayor and Mr. Thomas Battam had consented to act in the London Committee of Advice.

It was resolved to request the following gentlemen to allow their names to be added to the list of the committee :—

Mr. BRANDRETH GIBBS ; Alderman HALE, Lord Mayor elect.

It was resolved that the Honorary Secretary be requested to make the following communication to the Dublin Executive Committee :—

"The London Committee of advice beg that the Executive Committee in Dublin will forward a reply to the inquiry as to the available space for the several departments of the Exhibition, and will furnish information of the views entertained, and proceedings taken with reference to the Fine Arts.

"THOS. WINKWORTH."

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FRIDAY, 7TH OCTOBER, 1864.

The committee met this day at 4 o'clock. Present:—

THOS. WINKWORTH, Esq., in the chair; Professor ROBERT BENTLEY; E. A. BOWRING, Esq., C.B.; B. T. BRANDRETH GIBBS, Esq.; J. B. WARING, Esq.; M. DIGBY WYATT, Esq.

The minutes of the previous meeting were read and confirmed.

The committee were informed that—Professor BENTLEY, Mr. FAIRHOLT, Mr. BRANDRETH GIBBS, and Alderman ROSE, had consented to join the committee; and that Lord STANLEY, Sir J. EMERSON TENNENT, and Mr. BERESFORD HOPE, had declined doing so.

The Secretary was requested to communicate again with Mr. Beresford Hope.

The following resolutions were adopted:—

“That this committee having anxiously discussed the prospects of the Dublin Exhibition, and feeling convinced that the shortness of the time intervening between the present date and that fixed for the opening, demands instant action in order to insure the success of the Exhibition, would strongly urge upon the Executive Committee the expediency of at once determining upon the practical details of the scheme.

“That the Executive Committee be requested to reduce to writing their decisions upon such details, and to communicate them as early as possible to this committee (or otherwise make them public), and at the same time to specify the method in which they would desire that this committee should render their assistance in carrying out their arrangements.

“That this committee, in addition to any other detailed information which the Executive Committee may be enabled to afford, are anxious to obtain:—

“I. Plans of the building on a large scale, both of the ground and gallery floors, showing spaces reserved for foreign countries, and for special classes of goods.

“II. Sections of the different portions of the building, showing heights and modes of lighting.

“That this committee consider that the most desirable method of obtaining this information would be by means of personal communication on the spot between their assistant secretary, Mr. Iselin, and the Executive Committee.

“That the above resolutions be communicated to the Executive Committee, with a request that they will state whether it is their wish to receive a visit from Mr. Iselin for the purpose mentioned.

“CUSACK P. RONEY.”

FRIDAY, 21ST OCTOBER, 1864.

The committee met this day at 4 o'clock. Present:—

Sir C. P. RONEY in the chair; E. A. BOWRING, Esq., C.B.; F. W. FAIRHOLT, Esq.; R. A. THOMPSON, Esq.; J. B. WARING, Esq.; H. S. WAY, Esq.; G. F. WILSON, Esq.; T. WINKWORTH, Esq.

The minutes of the previous meeting were read and confirmed.

Several letters from the Dublin Executive Committee were read and submitted to the meeting.

It was resolved:—

“That this committee have considered the proposal of the Executive Committee to fix the end of November as the limit of the time for the reception of applications for space, and that looking at the present depressed condition of trade, they would urge on the Executive Committee the advisability of extending that period to the 31st of December.

“That this committee having before them experience of former Exhibitions, would press on the Executive Committee the importance of making no fixed arrangements for the accommodation of individual exhibitors until the allotments of space can be considered as a whole—but that having regard to the number and position of intending exhibitors of mediæval metal work and furniture, they are of opinion that it will be of advantage to allow such manufacturers to exhibit together in what may be called a Mediæval court, the space for which might be settled at an early period.”

The Secretary was requested to write to the Institute of British Architects requesting them to give their assistance in the formation of a collection of architectural designs and models for exhibition.

With reference to the resolution of the Executive Committee on the subject of antiquities from the South Kensington Museum, the Secretary was instructed to forward the same to the Secretary of the Science and Art Department, at the same time requesting the department to co-operate in the objects of the Exhibition.

The Committee were informed that Mr. John Hunt, of the firm of Messrs. Hunt & Roskell, had consented to act on the committee, and that the Duke of Sutherland had declined doing so.

A communication from Mr. Sanders was laid before the meeting, stating that Lord Powerscourt had suggested that Lord Overstone, Sir E. Landseer, and H. J. A. Munro, Esq., should be invited to join the London Committee of advice. It was considered unnecessary to repeat the request to Lord Overstone, who had already declined, but the usual letters of invitation were directed to be sent to the remaining gentlemen.

GEO. GODWIN.

A copy of the following letter having been addressed to the General Managers of the London and North Western, Great Northern, and Great Western Railways,

“Dublin International Exhibition, 1865.

“London Committee of Advice,

“House of the Society, Adelphi, London, W.C., Sept. 12, 1864.

“SIR,

“Referring to an application which has been made on behalf of the Dublin International Exhibition for the same privileges for the carriage of goods as were accorded by the railway companies to the International

Exhibition of 1862, I beg to express, on the part of the committee which has been formed here to aid this exhibition, their earnest hope that your Company will be pleased to give the application its most favourable consideration, as the undertaking is of a truly national character, and not a mere commercial enterprise. The Exhibition is in the hands of an influential committee of patriotic and energetic men, and the surplus profits of the Exhibition will be applied, under the direction of a disinterested committee, for public national purposes, in the interest of arts, manufactures, and commerce.

"I am, Sir, your obedient servant,

"P. LE NEVE FOSTER,

"Hon. Sec. to the Committee."

The General Manager of the first-named replied as follows:—

"London and North Western Railway,

"General Manager's Office, Euston Station,

"London, N.W., Oct. 3rd, 1864.

"Sir,

"In further reference to your note of the 12th September, I now beg to state that if the proposed Exhibition in Dublin, in May, 1865, be of an International character, and not intended for the pecuniary advantage of the Winter Garden Company, my directors will be prepared, so far as they are concerned, to carry goods for the Exhibition on the following conditions, viz.:—Articles, fine arts, and goods generally, from English stations, to be charged the full rates to Dublin, and returned *free*, if sent back within a fortnight after the close of the Exhibition, with a certificate from the Secretary that the articles have not been sold, but remain the *bona fide* property of the exhibitor.

"I am, Sir, yours very respectfully,

"W. CAWKWELL."

"P. Le Neve Foster, Esq., M.A., Society of Arts, John-street, Adelphi, W.C."

to which the following reply was forwarded:—

"London, Oct. 4, 1864.

"Sir,

"I am favoured by your letter of yesterday's date, which I have forwarded to Dublin for the information of the Executive Committee.

"I may be allowed to point out to your directors that the concession they have made will be rendered practically nugatory by the shortness of the time to which they have limited the return of goods from the Exhibition. It will be perfectly impossible that the Exhibition can be cleared within a fortnight.

"I am, Sir, &c.,

"(Signed),

"P. LE NEVE FOSTER,

"Hon. Sec. to the Committee of Advice."

Subsequently the London and North Western Company conceded an extension of time for the return of goods from the Exhibition, many cases having been sent back as late as January, 1866.

The following was the form of circular letter addressed to the several Chambers of Commerce, throughout the kingdom, and of other letters sent, inviting co-operation:—

"Dublin International Exhibition, 1865.

"London Committee of Advice, House of the Society of Arts,

"Adelphi, London, W.C., 29th Sept, 1864.

"Sir,

"I am directed by the London Committee of Advice to call your attention to the enclosed prospectus of the Dublin International Exhibition, with a request that you will be good enough to lay it before your Chamber of Commerce, whose support to the undertaking they are anxious to obtain. The purpose for which the London Committee was formed is explained in the enclosed circular issued to exhibitors. To secure a proper representation of the manufactures and industries of your town and district they invite the Chamber of Commerce to give the benefit of their active assistance in making known the advantages of this Exhibition, and in enlisting the co-operation of exhibitors.

"I am, Sir, your obedient servant,

"P. LE NEVE FOSTER,

"Hon. Sec. to the London Committee of Advice."

"House of the Society of Arts, Adelphi, W.C.,

"October, 1864.

"GENTLEMEN,

"I beg to forward you the prospectus of the Dublin International Exhibition for 1865, which I am directed to request you will be good enough to lay before the Council of your institution. The London Committee of Advice, recognising the national importance of the undertaking, are anxious to secure a proper representation of Architecture as one of the Fine Arts, and they have instructed me to solicit the co-operation of your Institute. It is suggested that the formation of a small collection of architectural designs and models for exhibition might meet the views of your Council, and would be very acceptable to the Executive Committee.

"P. LE NEVE FOSTER,

"Hon. Sec. to the Committee of Advice."

"Messrs. Seddon and Hayward, Secretaries to the Royal Institute of British Architects."

"Dublin International Exhibition, 1865.

"London Committee of Advice, House of the Society of Arts,  
"Adelphi, W.C., 25th Oct., 1864.

"Sir,

"I have the honour of enclosing the copy of a resolution of the Executive Committee of the Dublin International Exhibition, and I am directed by the London Committee of Advice to request that you will submit it to my Lords.

"The London Committee, recognising the national importance of the Exhibition, and being anxious to promote its success, also venture to express a hope that my Lords will permit the Department to give generally its co-operation and support to the undertaking.

"I have the honour to be, Sir, your obedient servant,

"P. LE NEVE FOSTER,

"Hon. Sec. to the London Committee of Advice.

"The Secretary, Science and Art Department."

#### COPY OF RESOLUTION.

"Resolved,—That the London Committee be requested to apply to the South Kensington Museum for a selection of antiquities, relics of ancient art in stone, wood, metals, and other substances, with rubbings from monuments."

FRIDAY, 2ND DECEMBER, 1864.

The committee met this day at four o'clock. Present:—George Godwin, Esq., in the chair; Sir Francis Sandford; Professor Robert Bentley, Messrs. J. Anderson, Antonio Brady, H. W. Diamond, M.D.; S. C. Hall, P. C. Owen, H. Parkinson, S. Redgrave, R. A. Thompson, G. F. Wilson, F.R.S.; and T. Winkworth.

The minutes of the last meeting were read and confirmed.

The committee having taken into consideration the question of the representation of the Fine Arts at the Exhibition, observe with regret the apparently backward condition of the arrangements for securing an attractive display of works of art. The Secretary was instructed to communicate with the Fine Arts Committee in Dublin, asking to be informed of those works which had been already promised for exhibition, and requesting precise details of the method in which it is wished that the London Committee should render their assistance in this important branch of the Exhibition.

The London Committee having been asked to advise the Executive Committee on the subject of advertising the Exhibition, are of opinion that it is of great importance that such advertisements should be at once inserted in all the principal London and provincial papers of England and Scotland. In order to secure unity of action as well as prominence for the advertisements, they would recommend that the execution of these details should be left in the hands of their honorary secretary, Mr. Foster, whose practical experience would ensure this work being done in the most satisfactory manner, and at the least possible expense.

The subject of the execution of a design and die for the prize medal of the Exhibition was submitted to the Committee, at the request of the Executive Committee. It was resolved to advise the Executive Committee to place both in the hands of the same artist. It was also resolved to recommend the Executive to make application to Mr. Leonard C. Wyon, modeller and engraver to the Royal Mint, of 54, Hamilton-terrace, St. John's-wood, London, to produce a die at a price of from £100 to £150, the design to be previously submitted to the Executive Committee.

THOMAS WINKWORTH.

#### EVENING MEETING AT THE SOCIETY OF ARTS.

With the view of bringing more prominently before the British public the intended Exhibition, Sir Robert Kane, a member of the committee, and well known for his varied scientific attainments, read a paper at the fifth ordinary evening meeting of the Society of Arts, on the 14th December, Lord Dufferin, K.C.B., occupying the chair. The meeting was very fully attended. The following is a copy of the paper read, and of the discussion that ensued:—

#### ON THE RECENT PROGRESS AND PRESENT STATE OF INDUSTRY IN IRELAND: AND THE DUBLIN INTERNATIONAL EXHIBITION OF 1865.

By SIR ROBERT KANE, F.R.S., *President of Queen's College, Cork, and Director of the Museum of Irish Industry, Dublin.*

At the request of the Executive Committee of the Industrial Exhibition, which is to be held in Dublin in the Summer of next year, I have undertaken to bring under your notice this evening some explanation of the circumstances under which that Exhibition has been undertaken, and the arrangements which have been made to secure its success, together with such notice of the present position of Ireland, in an industrial point of view, as may enable the members and visitors of this society, representing as they do so fully the industrial intelligence and commercial energy of this country, to judge whether the objects for which we in Ireland are now labouring are worthy of that sympathy and co-operation which I trust we shall be able to obtain. Almost simultaneously with the earliest efforts of this society, to realize, by means of exhibitions, the actual position of British industry, similar exertions were made by those in Ireland, who were anxious to direct the energies of that country to the permanent and solid advantages of industrial

pursuits; and amongst the means employed for that useful purpose, exhibitions of manufactures held a prominent place—these, although necessarily of a local and limited character, obtained a large amount of popularity and success. All such exhibitions, however, whether held here or in Dublin, could be considered but as the faint glimmerings of dawn heralding the full refulgence of the day when under the august Prince, whose loss the friends of intellectual and industrial progress will always deplore, the Exhibition of 1851 was inaugurated, and that unparalleled review of the aggregated productive forces of the world was opened to the assembled nations. The impetus thus given led to a greater development being allowed to the exhibitions which took place in Ireland immediately after, as in Cork in 1852, and especially in Dublin in 1853. The objects were no longer limited to Irish manufactures, as they had previously been, but the British and foreign manufacturers were invited, to render the exhibition in Dublin, as in London, really international. The Dublin Exhibition of 1853, for which a building admirable in its adaptation had been provided by the liberal enterprise of Mr. Dargan, was remarkable for the introduction of fine arts as a leading department, and was honoured by the presence and approval of her Majesty the Queen and her illustrious Consort.

The great International Exhibition of 1862, which, after the interval of eleven years, renewed with still greater richness and completeness of illustration the glories of 1851, had naturally suggested that after a similar interval an International Exhibition should be held in Dublin. It may be stated that an exhibition has this year been held in Dublin, and attained considerable popularity. Being limited, with the exception of machinery, to the display of objects of Irish manufacture, this exhibition was on too small a scale to represent in any degree the progress which foreign and domestic industry has made within the past ten years.

The opportunity of which it is now proposed to make use, in order to organize in Dublin an international exhibition, which shall be the worthy successor of the great successes of 1851, of 1853, and of 1862, has arisen from the fact that a number of gentlemen, of whom it is only necessary to mention the names of the Duke of Leinster, of Mr. Guinness, and of Mr. Dargan, possessing at once the inclination and the power, have undertaken to provide for the citizens of Dublin a great winter garden and buildings containing concert and lecture rooms, supplying, but on a smaller scale, the resources and enjoyments of the Crystal Palace at Sydenham. An independent executive committee having been formed to organize and carry out an international exhibition, the Directors of the Winter Garden have most liberally placed their fine buildings altogether at the disposal of the Committee for that purpose, and the Executive Committee have gladly availed themselves of this truly patriotic proposal. The exhibition will, therefore, be organized under extremely favourable conditions, as all that in other previous occasions had entailed the greatest amount of expense, of responsibility, and of risk, will have been spontaneously and all but gratuitously provided, whilst the authority and direction is preserved entirely in the hands of the Executive Committee. The great advantage which will thus naturally result to exhibitors in the arrangement of their articles will be easily understood, and it has been arranged that all funds arising from the receipts above the payment of the expenses incidental to the exhibition, shall be vested in a committee of noblemen and gentlemen, under whose direction the excess shall be applied to public purposes for the advancement of arts and sciences in Ireland.

Such being the circumstances under which the proposed exhibition is to take place, I shall very briefly notice the position which the building occupies. It is situated on the south side of Dublin, and in what may be considered the most fashionable quarter of the city, close to the terminus of the railway which leads to the beautiful mountain scenery of Wicklow. The extent of space accommodation available may be found in detail by reference to plans which are in the office of this society, but I need only say that the accommodation already at their disposal is very large, and there are, as I believe, now present gentlemen representing the Committees of Advice and the Executive Committee who will be able, and I am sure willing, to supply information as to the details of space, much more precisely than I could attempt to do. The principal portion of the exhibition will be located in the great conservatories of the Winter Garden—constructions in glass and iron, rivalling the Crystal Palace itself in elegance of design, although of course much inferior in extent, and affording advantages as to supply of light and means of display which could not be surpassed.

Under those favourable circumstances it may be hoped that, not merely on public grounds, but even on the lower but more directly practical basis of individual advantage, we may hope for the co-operation of the manufacturers of Great Britain, who cannot fail to derive material benefit from bringing the products of their factories and workshops under the immediate cognizance of the Irish people. The Executive Committee have good grounds for expectation that the industrial resources and products of our Colonies and of the European Continental States, with scarcely an exception, will be adequately represented on that occasion. Gentlemen of great activity and intelligence have visited, on the part of the Executive Committee, the governmental authorities and the industrial centres of the continental states; they have been uniformly received

in a most friendly spirit, and have received promises of active co-operation. We shall thus have brought before the inhabitants of Ireland the most beautiful and perfect productions of the industrial enterprise and artistic genius of Italy, of France, of Germany, and of Belgium. We shall have, as I expect, very efficient evidences of what Ireland itself can do in the way of manufactures; and it is to be hoped that the British manufacturers, even satiated as they may well be with triumphs already gained, and somewhat fatigued from the exertions by which that success was earned, will still not allow an international industrial exhibition to take place without Great Britain being properly represented, the more when that exhibition will be held under the august sanction of her Majesty the Queen, who has most graciously been pleased to become its patron, and when the Executive Committee have reason to expect that the exhibition will be honoured by the presence of their Royal Highnesses the Prince and Princess of Wales.

Among the elements of success to which the Executive Committee attach the greatest value, must be considered the support and co-operation which has been received from the Council and officers of this Society. By their assistance a London committee of advice has been formed, which has contributed materially to our success. The all-pervading and well-earned influence of the Society of Arts throughout the manufacturing world, secures to its recommendation, or as I may say, to its endorsement, an attention that no other body could command; whilst the accumulated experience of its officers in everything connected with the organization and management of industrial exhibitions has even already proved of the utmost value. The members of the Executive Committee are therefore anxious that I should express how deeply they feel the benefits of the advice and assistance they have received from this society.

Whilst making the arrangements which I have endeavoured to describe, for procuring a full and satisfactory representation of the natural resources and industrial progress of our Colonies and of Foreign States, the Executive Committee has had its attention naturally directed to the position which the productions of their own country should occupy in the exhibition. Two courses were open to them—the one, of carrying out the principle of geographical classification, which will be adopted as regards the colonies and foreign countries, and thus to arrange the manufactures of Great Britain and of Ireland separately; or on the other hand, to merge all separate insular existence, and exhibit under one head the industrial productions of the United Kingdom. Although the former plan might have tended to conciliate to the undertaking a good deal of local feelings and honest prejudices, the Executive Committee have decided upon adopting the other course, and propose to arrange that all natural and manufactured products of Ireland shall fall into their respective positions as elements of the great total of British industry; extending to the results of industry, that fusion of interests and of objects which has already made so much progress in the political and social relations of those two countries.

In taking this course, however, the committee are quite sensible of the risk that the industrial productions of Ireland—which are so limited in amount and in variety, as compared with those of Great Britain—might easily be lost sight of, and pass unnoticed in the immensity of the results displayed by her more fortunate sister; and that, although acting upon the purest motives, and taking a course which I am sure will be found to be correct, they might be the innocent means of an injustice being done to the manufacturers of their native land. This it is desirable to prevent, and hence I feel it my duty in this paper, which may be considered as in some degree a foreshadowing of the exhibition which is to come, to supply a notice of the present condition of manufacturing industry in Ireland, not attempting to go into details, or to mention every department, but only such as may furnish an idea of what is being done, and what we may hope to be able to do in the way of successful manufactures.

Every person is familiar with the fact that—whilst in this country the great development of manufactures forms the characteristic of its social organization and the foundation of its political strength—in Ireland the manufacturing industry has not attained any similar extension, and that agriculture, generally speaking of an imperfect kind, forms the principal means of occupation and of existence to the people. Hence the terrible results which followed from the potato disease, and consequent famine in the years 1845-46, by which not less than a million and a-half of population was destroyed, and which, followed by a continuous stream of emigration, numbering not less than 80,000 a year, reduced a population of Ireland from 8,175,124 in 1841, to 5,798,967 in 1861. I do not feel called upon, or indeed here even authorized, to express an opinion as to how far this great diminution of population is to be regarded as a national misfortune, or the reverse; it is impossible, however, not to recognise that, under at least two points of view, society has benefited by the changes thereby introduced:—Firstly, by the establishment of the Landed Estates Court, by which the position of landed property has been simplified, and the introduction of an improved system of agriculture facilitated. Secondly, the rate of wages has been very materially increased, and payments in money generally substituted for a complex system of allowances, which practically left to the agricultural labourer little beyond the mere permission to live.

A population thus specially devoted to agriculture in its simplest form can turn only with difficulty, and under great stimulus, to manufacturing operations, so much more complex in their nature, and requiring so much more of intellectual exertion for their successful prosecution. In fact, even in England the first introduction of the staple manufactures had been mainly due to the successive waves of foreign population—Flemings, Germans, and French, who, retiring from the political and religious persecutions to which they were exposed in their respective countries, sought the safety and refuge which England alone, then even as now, presents to all that peaceably land upon her shores. To the philologist a curious study is afforded in the technical expressions still employed in the every-day language of the English workman in various manufactures, marking the foreign origin of these trades, and even the time and circumstance of their importation.

Similarly in Ireland we were indebted principally to strangers for the introduction of those branches of manufacture which were subsequently carried on with most success; and in many cases the names most eminent, even at the present day, among our mercantile community, mark unmistakably the historical events which had deprived their native countries of the ancestors of such worthy sons.

The absence from Ireland of any abundant deposits of bituminous coal, such as occur in this island, and on which gift of nature has been built up the colossal fabric of England's industrial power, necessarily prevents the establishment in that country of those branches of trade in which the cost of fuel forms any very large proportion of the total cost of production. Hence, although possessing in abundance deposits of the richest iron ores, we have not had any successful establishments of iron smelting in recent times. The iron ores, however, both as earthy carbonate, and as hematite, are now largely exported from Ireland to this country to supply the enormously increased demand. Similarly, although large quantities of copper ore are raised in Ireland, principally in the southern counties of Cork and Waterford, the ore is shipped to Swansea to be smelted, as the large proportion of fuel which is required in smelting copper would render the progress in Ireland too costly to be profitably carried on.

In the case of the ores of lead and silver, however, the proportion of fuel necessary is not so large, and not merely are all the lead and silver ores raised in Ireland smelted in the vicinity of Dublin, but a large quantity of foreign ores of those metals are imported for Irish smelting works, the produce from which is highly esteemed, not merely in the local but in the British markets. I believe that this department of mineral industry will be found very efficiently represented by Irish smelters in the coming exhibition.

Although the smelting of iron ores and the actual manufacture of iron is not now carried on in Ireland, yet there is a very large amount of trade in the making of machinery, especially of the linen manufacture, of steam engines and water-wheels, and of late years of iron ships. The latter business has already assumed large proportions. The Messrs. Harland and Wolf, of Belfast, have built in the last ten years twenty vessels, of an aggregate average of 36,913 tons, giving employment to about 1,200 men. The establishment of Messrs. Malcolmson, at Waterford, is similarly active, and employs about 300 men, turning out annually at least one first-class steamer, mostly above 2,500 tons burden each, and engaged in Transatlantic voyages. The establishment of Mr. Pike, in Cork, is equally successful; whilst that of Messrs. Walpole, Webb, and Bewley, of Dublin, although only two years in existence, already gives employment to about 600 hands, and has completed five vessels, of which one of 1,434 tons burden, the *Knight Commander*, was almost the only ship that rode out uninjured the terrific cyclone that recently caused such frightful calamity at Calcutta. I mention these particulars to illustrate how much of industrial activity there already exists in Ireland, and how marked the extension of that activity in certain departments has latterly become.

A very large branch of mining industry in Ireland—that of iron pyrites or sulphur ore—becomes the basis of an extensive series of chemical manufactures, which, however, are limited, just as in the case of iron smelting, to those branches in which the cost of fuel does not form a preponderant proportion of the total cost of manufacture. In Dublin, Cork, and Belfast, large quantities of sulphuric acid, of chloride of lime, sulphate of soda, magnesia, &c., are made; the important branch of alkali making, as caustic, and carbonate of soda, however, is not, as I believe, carried in Ireland beyond the manufactures of sulphate of soda.

In mentioning the absence in Ireland of deposits of bituminous coal of industrial importance, it is, perhaps, proper to mention that several extensive coal fields, yielding, however, principally anthracite coal, exist in the interior of that country, and are worked with success and profit. Their produce is, however, not so well fitted for manufacturing purposes, and is all employed for domestic purposes in their localities.

I cannot pass from the subject of Irish fuel without reference to what constitutes so important a feature in the scenery and the agriculture of Ireland—the Irish peat-bogs. The reclamation of those great tracts of land to the uses of agriculture, and the employment of those stores of peat to the purposes of fuel, have occupied, and very properly, a very large amount of

attention; but, whilst recognising fully the importance of the subject, it will be seen that the progress of society and of the industrial arts in later years has divested the question of much of the paramount importance that formerly belonged to it. In regard to the restoration of the peat-bogs to agricultural purposes, the first and necessary element must be a perfect drainage—a measure of truly national importance, indispensable for the proper cultivation of even the best land, and, in considering which, the improvement of mere peat mosses cannot be held the primary object. But now that by the researches of Liebig, of Lawes, and others, the true principles of the growth of agricultural crops are understood; it is well known that even thoroughly drained peat will not supply the materials required for the production of food, and that the cost of supplying those materials, in the form of manures, if applied to the same area of land of more suitable constitution, will yield greater and more profitable returns. Hence, where ordinary farm land can be obtained, its improvement is preferable, as a field for the employment of labour and of capital, to the reclamation of peat bogs.

Similarly, the altered circumstances of the country have deprived the question regarding peat as a fuel of much of the importance that formerly was attached to it. The facilities for internal intercourse afforded by the railway system which Ireland already possesses, and which tends every year to expand, together with the low rates of freight, which allow the introduction of sea-borne coal at moderate prices, all tend to limit the area within which peat as a fuel can be advantageously employed, and to confine its use to the vicinity of the bogs and to the agricultural population. The heating power of peat being, even when best prepared and driest, not more than two-thirds of that of coal, together with the greater cost of transport of a bulkier and less valuable article, place a limit to its economy which will determine practically the area within which it can be employed. The various plans proposed from time to time for the preparation of compressed peat have therefore been found not to possess the pecuniary advantages which had been at first expected from them, although eminently successful in so far as producing a compact, convenient, and agreeable fuel, which, in some respects, may deserve a preference over coal, although it cannot do so for general manufacturing purposes.

The soil and climate of Ireland have always been favourable to the growth of wool, especially of the longer stapled kind, and at an early period the quantities of Irish wool exported to England were considered to interfere so much with the interest of English wool growers as to lead to some harsh fiscal regulations. Owing to various circumstances of the country and of the times, the woollen trade of Ireland had declined very much indeed, until within the last few years, when it began to revive, and it is now every year rapidly expanding in extent of business and in the variety of articles made. Thus in Dublin, in Cork, in Waterford, and in various inland towns, woollen and worsted mills that had been abandoned have resumed work, mills already in action have augmented their number of looms and spindles, and new mills are being erected. This great improvement is partly due to the fact that the diminished supply of cotton has produced a general increase of activity in the woollen trade, and also to the excellent character which Irish-made woollen goods have acquired in the English markets, being practically free from those sophistications that are but too commonly in use. The actual expansion of this branch of industry within ten years is shown by the fact that the number of woollen and worsted mills in Ireland had increased from nine in 1851 to forty-three in 1863; being nearly 463 per cent.

The cotton manufacture exists in Ireland but to a limited extent; and latterly, since the diminution of the supply of cotton, many mills have been altered from cotton to flax spinning and weaving, in order to meet the increased demand for linen goods. This has been the case to a great extent with the factories of Messrs. Pim, at Dublin, and of Messrs. Malcolmson, near Waterford. The latter, belonging to the same enterprising family which I have mentioned already in reference to the building of iron ships, is one of the most completely-organized manufacturing establishments with which I am acquainted. It contains 31,000 spindles and 950 power-looms, with all the necessary machinery required for the spinning and weaving department. Being to a great extent isolated from other works they are obliged to depend on themselves, in many cases, for the construction and repairs of machinery, and hence there is attached to the mill a foundry and mechanics' shop, where machinery equal to any made in the best English workshops is constructed. The total number of hands employed by the Messrs. Malcolmson, in their various works, may be taken as averaging about 3,000.

The mixed woollen and silken tissues, which are known as poplins, or tabinets, have been considered as peculiarly an Irish fabric, but the manufacture was first introduced into that country at the beginning of the eighteenth century by some Huguenot refugees. This branch of trade had of late years considerably declined, until the recent commercial treaty with France, which opened up the markets of that great country, where the rich tissues of the Irish looms were extremely popular. Since that time the poplin trade has been very active, every competent hand being fully employed until within the last three months, when a reaction appears to have

occurred, which has somewhat diminished the demand. This interesting branch of trade gives employment principally in Dublin, to more than 1,200 persons, of whom about one-fourth are employed by the Messrs. Pim, a firm active in all that tends to promote intellectual cultivation and industrial habits, giving, in their various departments of business, occupation to over 1,000 hands, and providing not merely for the material wants of those in their employment, but practically evincing most praiseworthy interest in their moral and social life. By the example of such employers, labour is truly dignified, and leaders of industry vindicate their right to the high position which, in this country, has been so justly conceded to them.

Of all branches of industry, however, that which is of most importance to Ireland, from the amount of capital it represents, and the number of persons to whom it gives occupation, is the linen trade. I am indebted to the kindness of Mr. M'Irath, secretary to the linen trade of Belfast, for much valuable information on that subject, and also to Mr. M'Call, of Lisburn, for many interesting particulars, of which I shall endeavour to lay before the society such general heads as our limited time may allow.

The linen trade of which Belfast had long been the established head-quarters in Ireland had been rather falling off in amount, until the interruption of the supply of cotton by the American war called it into immensely increased activity. The contrast in this regard is well shown by the following figures:—In 1859 there were in Ireland 82 flax-spinning mills, containing 651,872 spindles, of which 91,230 were unemployed; whilst in 1864 there were 74 spinning mills with 650,744 spindles, of which but 8,860 were unemployed; whilst 50,638 additional spindles were in May last about being set to work. Further, in addition to the above, there were employed, in 1864, 14,648 spindles, occupied in making thread, and five mills were in course of erection, to contain 45,000 spindles. In regard to powerloom factories for linen, a similar remarkable increase is shown for the same period. Thus, in 1859, there were 28 factories with 3,633 looms, of which 509 were unemployed, whilst in 1864 there are 42 factories with 8,187 looms, of which but 258 are unemployed; 1,685 additional looms were about being set to work at the date of the return in May last. The introduction of the factory system into the linen trade, and especially the power-loom, is comparatively modern, the first spinning-mills for flax in Ireland having been established about 1828, previously to which time cotton spinning was much more extensively carried on in Belfast than it has since been.

The great extension of trade and the benefit to the operative classes which followed this change may be illustrated by the following fact:—When spinning and weaving were done by hand, the firm of Richardsons, of Lisburn, turned out from 15,000 to 20,000 pieces of goods in twelve months; that firm can now deliver 250,000 pieces of bleached goods in the same time.

As to wages in the old days of spinning on the domestic wheel, the earnings were from 2s. 6d. to 4s. weekly, whilst at present in spinning mills the ordinary workwomen make from 3s. 6d. to 6s. per week, and superior hands from 6s. to 8s. The best hand-loom weaver can only make 6s. per week, out of which he has to pay charges which leave him only 5s., whereas an expert girl, who can attend to two power-looms, can make 10s. per week clear. Thus the earnings of individuals have been materially increased by the introduction of steam machinery in the linen trade; and in regard to the total amount of employment, there were ten years ago 17,000 persons employed in this trade in and about Belfast, whereas in the present year the number employed in the mills is 25,000, exclusive of the vast number of outsiders who indirectly derive their subsistence from that branch of manufacture.

Coupled with this development of the linen trade, there has taken place a great increase in the quantity of flax cultivation in Ireland. During the Crimean war, when the Baltic trade was subjected to certain impediments, the quantity of land under flax was increased and amounted in 1853 to 174,579 acres, but on the restoration of peace, the Baltic trade being resumed, the demand for home-grown flax diminished, and the cultivation fell off to 91,646 acres in 1858. Since that time it has again progressively increased, and has now assumed proportions entirely unprecedented, the quantity in 1863 having been 214,099 acres, and in the present year having increased to 301,942 acres, which at an average of 35 stones of clean-scutched flax to the acre, gives the produce of fibre at 10,567,970 stones, or 66,050 tons; and at an average price of 7s. 6d. per stone, the total value of the crop of the present year, is £3,962,989. This great increase of production is accompanied, of course, with corresponding increase of the export trade. The total value of linens exported from the United Kingdom has nearly doubled within the last three years, having been in 1863 £8,460,039, against £5,193,347 in 1861.

A corresponding increase has taken place in the branches of steam engine and machine making connected with the linen trade. The foundries and workshops occupied in that way have fairly doubled in extent of business and number of hands employed, while wages have increased within the last two years from 10 to 15 per cent. Simultaneously, the general trade of Belfast has increased to such a degree, that in the year 1863 the imports amounted to £8,505,991, and the exports to £10,472,598. The tonnage of the port in 1861 was 920,800 tons, and the revenue

£40,600; whilst in 1800 the tonnage of Belfast had been but 54,200 tons, and the revenue collected but £2,740.

Closely connected with the linen and cotton manufactures are the important industries to which the refuse and worn-out remains of textile fabrics are devoted—the manufacture of paper and pasteboard. This branch of trade is extensively carried on in Ireland, especially in the neighbourhood of Dublin. The quantity of paper manufactured annually at the time the duty was repealed was between 9 and 10 million pounds. The advantage afforded to the introduction of foreign-made paper by the late commercial tariff has depressed the condition of the paper trade in Ireland as it has done in this country, but it may be hoped that the relaxation of the export duty on rags, which has lately been made in the Treaty of Commerce between France and Switzerland, will mitigate, after some time, the disadvantage under which the British maker is now placed. In regard to specially Irish interests, I may mention that the lower price of straw in Ireland has led to a very extensive manufacture of the low-class paper containing that material, and that a large proportion of the cheap literature of London is printed on Irish manufactured paper.

A very large source of employment is afforded throughout Ireland, especially in the northern districts, in the sewed muslin trade, which occupies, it is estimated, over 300,000 females. The products of this industry are generally sent into commerce as Scotch, the greater number of the firms giving out the work being of that country. Indeed, this class of occupations are curiously cosmopolite, and illustrate the tendency of industry to overcome the distinctions of country and of race. Thus in the trade of shirt making, by which considerable employment is given in Ireland, I have been informed that for some large houses the shirts are cut out and sewn in Ireland, are sent to Scotland to be washed, thence they pass on to London to be made-up and prepared for sale. Most of the shirts, however, manufactured in that way are intended for exportation.

Minor industries of that class are, I am happy to say, being introduced and extending themselves in Ireland. Thus the making of ladies' corsets and crinolines was commenced in Dublin by the enterprise of Mr. Crotty, some few years back, and his firm now employ 700 girls, who earn from 5s. 6d. to 10s. per week, producing at the rate of about £60,000 worth of corsets per year, all of which, as I believe, are exported to this country. For it is a remarkable, and I believe a healthy characteristic of Irish manufactures, as they are now carried on, that they do not depend for their success on any excitement of misdirected though honest patriotism or protection. In fact, the prejudice is entirely the other way, and the Irish manufacturer meets much more ready customers abroad than he can find at home. This, however, is not peculiar to Ireland. Similar feelings are met with in every country; and it is most creditable to the manufacturers in Ireland, that in every branch their products find a welcome reception both in Great Britain and in foreign countries, grounded on the confidence which has been established in the honesty of the materials and the excellence of their make.

It would be unsuitable if, in speaking of Irish manufactures, I omitted noticing what had been long considered the staple manufactures of that country—porter and whiskey. Of the latter, the production and consumption has of late years very much declined, the quantity of Irish-made spirits entered for consumption having fallen off from 8,136,362 gallons in 1853 to 3,898,268 gallons in 1863. This enormous decrease is due partly to the increase of duty, but I believe in a greater degree to the improved habits of the people.\* A large increase in the production of ale and porter is shown by the returns of malt on which duty was paid, which rose from 1,376,148 bushels in 1855 to 2,234,947 bushels in 1863. This increase, however, is in great part represented by the development which the export trade in porter has received.

Those remarks will serve to illustrate in some degree the position which the Irish manufactures may be expected to take in the approaching Exhibition; and although (with the exception of the linen trade), not comparable in extent with the same branches of industry as carried on here, yet it will, I believe be found that what is done is done well, and will establish the right to an honourable companionship with their fellow-labourers in Great Britain.

I am indebted to my friend Mr. Barrington (who, I hope, will have the honour, as Lord Mayor of Dublin in the coming year, to receive us in a manner worthy of the city and of the great manufacturing firm, which he so efficiently represents), for some details as to the position of the soap and candle trade, which is carried on to a considerable extent in Ireland, especially in Dublin; about 230 tons of hard soap and about 40,000 dozen pounds of candles being made weekly. This manufacture, which has been said to constitute a test for the civilization of a country, is steadily progressing in Ireland.

Under these circumstances, I trust that the manufacturers of Great Britain will not

\* The exports of Irish whiskey in 1865 were 1,772 butts and puncheons; 2,685 hogsheads; 888 casks; and 2,105 quarter casks.—[Editor.]

hesitate to lend their assistance towards rendering the exhibition a sufficient representation of the productive power of our common country. Now that the intervening channel has been practically bridged by the splendid steamers which give to the passage more than the security, and almost the comfort of a railway train (the journey from London to Dublin occupies but a portion of a day), we may by our uniting on the common ground of industrial fellowship, contribute to cement that union by which the greatness and the tranquillity of the empire is secured. The position and the prospects of Ireland have been represented in very desponding colours. Her woes and losses have been eloquently traced to commercial jealousy and political misgovernment, and there has been but too much foundation for that charge. We have, as I hope, however, passed from the crimes and errors of an ignorant and bigoted age into a time when the blessings of education have taught all classes the true road to national prosperity, and when a more enlightened and tolerant spirit governs the relations as well of nations as of individuals. Scarcely beginning to recover from the fearful visitation of the potato famine, Ireland has had to pass during the last five years through a succession of wet seasons and bad harvests, entailing an annual loss, estimated by the highest authority, Judge Longfield, at five millions annually, or 25 millions in the five years. No wonder, then, that her agricultural capital has not augmented during that time; that the quantity of live stock has not been multiplied; that the area under cereal crops has not increased. But, with all this, even with the emigration of a class which it would be desirable, if possible, to keep at home, the amount of crime has been diminished by one half, and of pauperism to six-tenths within the last ten years, whilst wages have risen as well in agricultural as in manufacturing districts to a point practically equal to the cost of labour in this country.

Our visitors next year need not imagine that in crossing a narrow channel of the sea they will pass into a wilderness, where agriculture is abandoned and trade extinct, among a population lawless and pauperized, abject and ignorant, whose only signs of national activity are outbursts of political and sectarian strife, miserably caricaturing that grand struggle which settled the constitution of this country a century and a-half ago. Under a surface scum of passion and discontent, which represents the former Ireland, and is every day melting away, the humanizing influence of education, and of equal laws, have called forth a new and a better Ireland, a population intelligent and moral, peaceful and provident, able and willing for any work that may be set before them, and seeking such work even in the most distant portions of the globe. Such a people require only fair and considerate guidance and example to constitute themselves admirable materials for industrial enterprise, and prove themselves worthy to participate in the prosperity and power of this great empire. I regard, as highly conducive to that great end, that our British neighbours, especially those who are themselves engaged in industrial pursuits, should know more of Ireland, and of its people; that they should learn to judge of the people and of the country as they now are, and not by the newspaper exaggerations and stories of a by-gone time. Such means of calm and dispassionate judgment will be afforded by the opportunity of the Exhibition next year; and—as I believe the result will be to elevate the position of Ireland and of its people in the opinion of those who are more competent to decide, as well as the most interested in the result—I do trust and expect that England and Scotland, as well as more distant foreign countries, will be well represented as visitors and as co-operators in the approaching exhibition.

#### DISCUSSION.

Lord Powerscourt would, as Chairman of the Fine Arts Committee of the Exhibition, offer a few remarks. There could be no doubt that the fine arts could not flourish in a country which was not materially prosperous. Refinement and art were the children of education, and education in any country was not obtained without a certain degree of affluence. The history of the world showed that the wealthiest and most powerful people had been the foremost in the fine arts. The great emporiums of riches and commerce, such as Manchester, Liverpool, and other manufacturing cities, were the places where at the present time the greatest encouragement was shown to painters and sculptors. Ireland, unfortunately, was not in the position of affluence and superfluity which England enjoyed. The causes of this state of things he need not enter into, but in a backward country like Ireland the difficulties were great, on account of many conflicting and antagonistic interests. It was, however, more than ever the object of any lover of his country to do what he could to promote the civilization and refinement of his countrymen; and in cultivating a taste for the fine arts, he believed we should aid materially in this direction. Unfortunately his countrymen had not yet sufficient confidence in a rule which sought to place them as free citizens on a noble equality with the rest of civilization by means of education and refinement. He thought if all classes in Ireland gave more encouragement to the arts and sciences, it would tend to raise Ireland to the level of other countries. International Exhibitions were great promoters of intercourse, and friendly intercourse promoted mutual improvement.

He was happy to add that the prospects of the Exhibition in this department over which he presided were most encouraging, and he had no doubt that the artistic display in Dublin in 1865 would be of a very attractive character.

Mr. Vesey Fitzgerald said that these Industrial Exhibitions, more than anything else with which he was acquainted, demonstrated the fact that individual effort, in the present age, attained the largest results when it availed itself of the power inherent in the principle of co-operation; for these exhibitions depended on the co-operation of class with class, of country with country, and of man with man. They produced fruit, and the production of fruit was what Lord Bacon held forth as the great recommendation of his system of inductive philosophy, which had formed the basis of the development of science and of material progress that had been witnessed by the last two centuries. All the education of the popular taste and faculties which was imparted by the study of the fine arts, was afforded in the most effective manner by these exhibitions. But they led also to an advance in artistic skill, and to the general improvement of manufacturing processes. The committees appointed by this society, in consequence of the last Great Exhibition in London, were calculated to be of great use in this way, and, without doubt, would prove to have been most beneficial, but it was, of course, difficult to know the exact nature of improved processes adopted by individual producers, until all idea of secrecy connected with them had passed away; so that it could not be immediately ascertained. New articles, and patterns of various goods, however, met one's eyes every day, the idea of which was taken from things seen in these exhibitions. He would conclude by expressing his conviction that the principle of improvement inherent in these exhibitions was most powerful in its operation, and that the extent to which it might probably be felt was obviously impossible to estimate.

Mr. Hercules Macdonnell, in responding to the call of the chairman, said it was not his intention to enter into any of the many general topics which had been so well discussed in the interesting paper they had heard. He merely wished to add, as supplementary to what had been stated by Sir Robert Kane, a few facts which had come within his own personal knowledge, and tending to show that the Exhibition was likely to be eminently an International one. As one of the Executive Committee, it fell to his lot to put himself in communication with Foreign governments, and more particularly those of Southern Europe. He begged, in the first instance, to return his thanks to the members of this society and to the officers of the South Kensington Museum, who had furnished him with information as to the best means of proceeding, and with introductions to those most likely to aid him in his object. They had supplied the much-needed compass without which he would have been unable to steer his course in that, to him, novel undertaking. He in the first instance went to France, and he was happy to say his application was not at once acceded to. The French Minister showed great willingness to listen to all he had to say, but he required to be satisfied as to the soundness of the undertaking. The result, however, was, that the Government were satisfied on that head, and decided that the enterprise was deserving of their support and co-operation. And here he might say the promoters of this Exhibition did not feel themselves in the position of those who undertook a similar duty in 1862—viz., to solicit Foreign governments to give pecuniary aid to the undertaking. It was felt by the promoters of the undertaking that all they could ask foreign governments to do was, to forward the goods of their exhibitors to the nearest seaports, from whence the managers of the Exhibition would provide for their transport to Ireland, undertaking to send back the objects unsold to those ports, and to pay the insurance. In France he was happy to find that so able and enlightened a government gave its assistance and co-operation to the enterprise. Prince Napoleon, who was not only a prince, but a man of great talent and large experience in exhibitions, took up the matter warmly, and he (Mr. Macdonnell) had reason to think the opening of the exhibition would be honoured by his presence. Backed by the example of so great a nation, he next proceeded to Belgium, where, he was happy to say, he met with ready and almost enthusiastic co-operation, and many of those who acted as commissioners for the Exhibition of 1862 had undertaken the same duty in regard to the forthcoming Exhibition in Dublin. From thence he proceeded to Holland, where he met a very warm response, and that country would be well represented, and no doubt would acquit herself well in this contest of nations. After that he went to Frankfort, which, though not great in itself, was a most important commercial centre, and there a commission of men of the highest standing was formed, by whom would be brought together the varied products of the various states of Germany. He afterwards proceeded to Switzerland, and had reason to believe that there would be a good representation of the special products of that country, and they were not few. Thence he went on to the Kingdom of Italy—now more important than ever—and there he found the government most anxious to do what they could towards this enterprise, though they could not undertake a money expenditure for the purpose. He (Mr. Macdonnell) stated that pecuniary assistance was not asked for; all they wanted was official patronage and encouragement, by announcing to their subjects that the enterprise was worthy of support and co-operation. He was happy to state a large committee had

been formed in Turin, comprising the first men in Italy; and the question now was, not whether they should get objects from Italy, but where they should put them. Milan would send some of her best sculpture, and Florence would not be behind in artistic productions. In Rome, too, after some preliminary difficulties, he received the assurance of Cardinal Antonelli, and the Pontiff himself, that it should not be their fault if Rome was not as well represented in Dublin in 1865 as she had been in London in 1862; and he had since his return received a despatch, stating that a commission of the leading men of the country had been appointed to take charge of the matter. Austria was the next country he visited, and there the difficulties on financial grounds were as great as in any other quarter, which, however, he could not quite so readily meet, because he could not undertake to send a steamer to Vienna; but in this respect the ready assistance of Baron Rothschild was accorded in getting a reduced tariff on the railways for conveying articles to the seaboard, and he had every reason to expect an excellent collection from Austria. From Bavaria and Munich, the great school of mural decorations, there was a probability of some of those fine cartoons being sent which had not appeared in any previous exhibition. He believed every country in Southern Europe would be represented in its art and manufacturing productions. With regard to the usefulness and importance of such a display there could be no doubt. Sir Robert Kane was quite right in saying there was no antagonistic rivalry between the progress or genius of England and Ireland. On the contrary, he thought the one supplemented the other. The paper of that evening, as well as the discussion on it, would, he trusted, assist an enterprise whose only object was the advancement of their common country.

Mr. Antonio Brady said he had been deputed to visit the north of Europe. He had taken the Scandinavian nations, and had also good results to report. He had, however, met with the same objections on financial considerations as had already been referred to. The Swedish Minister had especially referred to the excessive expenditure incurred in the last Paris and London Exhibitions, which he was not prepared to recommend again. He was also met in many places with the idea that Ireland was a sort of Poland, in a state of anarchy and revolution, and there was no security for articles exhibited; and he was glad to find that Sir Robert Kane had given a very different and more truthful view of the general condition of the country. He desired to express his deep obligations to the officers of the South Kensington Museum, and especially to Mr. Owen, who had rendered the greatest service, not only by his advice, but by his letters of introduction to the foreigners who had been connected with the Exhibition of 1862. Having duly acknowledged the ready co-operation and courteous attention afforded by our ambassadors and consuls, Mr. Brady stated that the encouragement he met with throughout the Scandinavian provinces was such as to enable him to assure those interested, that most valuable contributions of artistic and manufacturing productions would be forthcoming from those northern nations. As regarded Denmark, unhappily he arrived just as the unhappy war, which had crippled the resources of that country, had closed. The enlightened government of that country, from the king downwards, had, after due consideration, promised hearty co-operation. The king himself, no mean artist, had promised to contribute to the exhibition, and he (Mr. Brady) was confident in the belief that Denmark would be as well represented as any other country in Europe.

Mr. Chichester Fortescue, M.P., having been called upon by the chairman, said, as a member of the Colonial department of the Government, he was glad to have the opportunity of saying, not only on his own but on the part of his right hon. friend at the head of that department, it had given them great pleasure to have been the means of bringing this laudable enterprise before the notice of the Colonies of Great Britain. He was not prepared to state in detail what the colonies respectively would do, but in general terms he might safely state that they were ready to respond to this invitation, and that the colonies of Great Britain would be properly represented in the capital of Ireland, as they had been in the capital of England. But, as an Irish member, he could not refrain from expressing his thanks to Sir Robert Kane for the extremely valuable and interesting address he had that evening delivered; and, more than that, he would express his thanks in the same capacity, if they would allow him to do so, to this assembly for having met here for the purpose of listening to and discussing such a subject as this. He thought it must strike many of them, as it struck him, while listening to Sir Robert Kane, how very great the contrast was between the former days to which he alluded and the present. He talked of days when Irish wool imported into England was considered a nuisance; but among all the statements and evidence put before them by Sir Robert Kane, there was none to which he attached more value, or for which he was more grateful as an Irishman, than the hopeful spirit he had expressed in his address. He felt inclined to thank every Irishman—above all every distinguished Irishman—who, like the ancient Roman, did not despair of his country. He confessed they heard too much, both from the press of Ireland and from public men, of that kind of despair which was too apt to fulfil its own predictions. He confessed a good deal of blame on that score attached to the class of men to which his noble friend and himself might be said to

belong—viz., to politicians. He did not use it as a term of reproach, though across the Atlantic “politician” was about the worst name one could call a man; but, happily, that was not yet the case on this side of the water. No doubt the last three or four years had been years of great trial to Ireland; but it was consoling, when unhappy, to know the cause of the unhappiness, and if they were suffering from misfortune, to know its source, and look forward to its termination. He believed there would not be a doubt that Sir Robert Kane had told the simple truth. He had heard from Irish farmers and men of business that the temporary check which had been experienced—for it was nothing more than that—had only been caused by the exceptional disadvantages of the three last Summers. It was a misfortune to a country to have but one string to its bow; and one of the great objects of this Exhibition was to endeavour to provide Ireland with other strings to her bow. He trusted what they had heard to-night would induce many in this room, and out of it, and those of other countries, to visit Ireland for themselves, to see what she had done, and what she could do; and he hoped foreigners would see that the miserable and contemptible libels poured on Ireland from some quarters were odious falsehoods. They would find that Ireland was not another Poland, but, on the contrary, a country—no doubt with many things, like other countries, requiring correction—but a country well governed, and capable, by exerting self-reliance, of taking a creditable position by the side of this country as an integral part of it. He trusted that would be the effect of this great enterprise. He hoped large numbers would visit the Exhibition, and next year make that passage between England and Ireland which Sir Robert Kane had described in such glowing terms.

Mr. Henry Cole, C.B., would merely call attention to one point which had not been touched on, either in the paper or in the remarks that had followed it. He hoped the Managing Committee of the Exhibition would provide for that which was now attracting great attention in London, and which might be made an interesting feature of the Exhibition in Dublin, viz., an exhibition of the industry of the workmen of Ireland, as a separate section. Of course the works of artisans and others would be exhibited among the manufactures, but he thought an attractive section might be made if the workmen of Ireland were inclined to show the fruits of their ingenuity.

Dr. Bachhoffner was anxious to know whether it was the intention of the Commissioners of the Dublin Exhibition to apply to the Government to pass a short Act of Parliament, as was done in the case of the Exhibition of 1862, for the protection of unpatented inventions.

Mr. Hercules Macdonnell stated that the Attorney-General for Ireland would prepare such a Bill to be introduced on the assembly of Parliament.

Mr. W. Hawes remarked that hitherto the discussion of this able paper had assumed almost entirely an Irish character. As he thought the facts stated and the views taken by Sir R. Kane were equally important to them as Englishmen—equally important to the whole country as to Ireland alone—he hoped he might for a few moments call attention to the facts, to show how they as Englishmen were interested in the success of this Exhibition. They could not see the progress of manufactures, of industry, and education; they could not hear that wages had been increased, that vice had diminished, and that the consumption of spirits had enormously decreased, without feeling that a country which perhaps had not hitherto raised the national character of the empire, was now progressing in a way which was calculated to make Ireland a source of great power and strength, and a country of which England had reason to be proud. As Englishmen we could contribute to the success of this enterprise, which had been so energetically taken up by the Irish people themselves. That Exhibition must not be received as a mere temporary display. It would have a permanent and beneficial influence on the industry and commerce of Ireland. It would stimulate her to rely more on herself, to establish new manufactures, and make herself more independent; and force into activity and life those seeds of prosperity which had long been lying dormant. A competition would be produced which would urge on both countries to produce better articles than they had hitherto done, and thus would the closer connexion with Ireland and her manufactures result in benefits to both countries.

Mr. Hartley expressed his opinion that much of the evil of the industrial system in Ireland would be remedied by a proper system of apprentice laws, by which the extension of skilled labour would be promoted, and a great want of the country supplied.

The Chairman said it was his pleasing duty to move that the thanks of this meeting be tendered to Sir Robert Kane for the admirable paper which he had been kind enough to read to them; and he only wished, that in doing so, he could adequately express what he was sure was the feeling of every one who had heard him. At all events, if he was not able to find words which would satisfy those whom he had the honour of representing, he could assure Sir Robert Kane that there was not one in the room who more thoroughly appreciated the perspicuity, the moderation, and the truth of every single opinion and every single fact to which he had given utterance. He might be permitted to refer to one or two points in which he could especially confirm, from his own personal experience, the observations made by Sir Robert Kane. Sir R. Kane had

stated it was to the development of Irish manufactures that they must principally look for the prosperity of that country. In that opinion he cordially coincided. As an Irish landowner he had been painfully aware of the innumerable ills which had arisen as a consequence of the undue pressure upon the land of Ireland. In consequence of so very few openings, indeed, he might almost say, no other opening being afforded to the industry of the country, except that which was connected with the cultivation of the soil, the peasantry of the country had been reduced to a condition which was incompatible with their prosperity or their comfort. There was no Irish landowner who, if he was a conscientious man, could dare to accept for his land the competition prices which would be offered for it. Land was, in fact, almost a monopoly, and the consequence was, the margin of profit to the cultivator, which in other countries was amply sufficient for education, decent clothing, and comfortable housing, was in Ireland reduced to the smallest possible extent. He was happy to be able to confirm, from his own experience, what Sir Robert Kane had stated with regard to the enormous stimulus which had been of late given to the linen manufacture. He happened to live in the neighbourhood of Belfast, and he believed nearly every manufacturer in that town was making something like £1,000 per week at this moment. A personal friend of his own, who, having acquired an ample fortune, was about to retire from business, offered his mill for sale two years ago, at the price of £80,000, and was bid only £70,000 for it, consequently he retained it in his possession, and a few months ago he had the satisfaction of disposing of it for £180,000. Before he concluded, he thought he should be fulfilling the wishes of those present, if he expressed their thanks to those two gentlemen who had acted as ambassadors to other countries on behalf of this Exhibition. He would now, on the part of the Society, return to Sir Robert Kane their most hearty and cordial thanks for the services he had rendered to them and to the cause of the proposed Exhibition, and of Irish manufactures. When, hereafter, Ireland should have attained that position of eminence in that career of progress which he trusted was now opening before her, the name of Sir Robert Kane would be remembered in the catalogue of those men whose patriotism and devotion to their country had laid the foundation of her prosperity.

Sir Robert Kane expressed himself as much gratified by the kind manner in which his paper had been received, and also by the way in which the Chairman had been pleased to express the thanks of the Society on this occasion. He assured the noble lord and the Society there was nothing from which he expected more practical advantage to the cause of the prosperity of Ireland than the increase of mutual good feeling and co-operation between this country and his own.

FRIDAY, 16TH DECEMBER, 1864.

The committee met this day at 4 o'clock. Present :—THOMAS WINKWORTH, Esq., in the chair; Messrs. ROBERT BOWLEY; E. A. BOWRING, C.B.; ANTONIO BRADY; BRANDRETH GIBBS; GEORGE GODWIN, F.R.S.; R. A. THOMPSON; J. B. WARING, and G. F. WILSON, F.R.S.

Messrs. F. W. BRADY and H. MACDONNELL attended on behalf of the Executive Committee.

The minutes of the previous meeting were read and confirmed.

Resolved :—"That while recognising the fact that a display of pictures of the Old Masters would form an attractive part in the Exhibition, this committee think it deserving of serious consideration on the part of the Executive Committee, whether the amount of space stated to be available for Fine Arts will be sufficiently large to accommodate them in addition to those of the Modern school."

Resolved :—"That this committee would urge strongly upon the Executive Committee the necessity of at once appointing an art commissioner to solicit and obtain the loan of works of art for the Exhibition."

ROBERT HUDSON.

At the January meeting it was resolved that the following letter be issued to the most eminent artists in the country :—

"SIR,

"I am instructed by the London Committee of Advice to call your attention to the Fine Arts Department of the International Exhibition which is about to take place at Dublin this year, and for which a permanent building is erected. The committee being anxious to secure a good representation of British art, trust that you will co-operate with them in promoting the object, to the extent of mentioning by name such of your works as you may wish to have exhibited, and which at the same time you think it probable would be lent by their owners, whom you will be kind enough to name. The committee also wish me to express a hope that you will use your influence with the owners to induce them to spare as many of their works of art as the committee may apply for.

"The Executive Committee undertake the free carriage to and from the Exhibition of such works of art as they shall ask on loan, together with insurance against risks in transport. They have also entered into arrangements with Mr. Green, of Charles-street, Middlesex Hospital, to undertake the packing, forwarding, and returning all the works of art lent to them.

"I have the honour to be, Sir, your obedient servant,

"P. LE NEVE FOSTER,

"Honorary Secretary."

Mr. J. F. Iselin was appointed by the Executive Committee, in December, their General Superintendent; Mr. H. E. Doyle, Art Superintendent; Mr. T. A. Wright, Superintendent of the British Department; and Mr. P. L. Simmonds, Colonial Superintendent; and they entered upon their several duties early in January. All these gentlemen had filled responsible posts in the London International Exhibition of 1862. Mr. John Sturgeon, of Leeds, was then placed in charge of the Machinery Department; and Mr. Andrew Corrigan, of the Royal Dublin Society, of the Agricultural Implement Department. The general list of the staff employed will be given hereafter.

## GENERAL PRELIMINARY ARRANGEMENTS.

### ALLOTMENTS OF SPACE.

THE applications for space by intending exhibitors in the United Kingdom having been seven times in excess of the whole quantity at the disposal of the Executive Committee, the latter found it necessary to refuse many applicants altogether and to considerably reduce the demand of others.

The following were some of the principal circulars and forms issued by the Committee:—

#### TRANSMISSION AND ARRANGEMENT OF GOODS.

I am directed by the Executive Committee to request that you will attach to each package intended for the Exhibition, one of the accompanying address labels.

Additional address labels may be obtained, if required, on application.

All articles intended for exhibition should be delivered at the Exhibition Palace, by the 15th of April.

In case of your not attending personally to superintend the arrangement of your goods, you will be kind enough to forward the name of your agent or representative, in order that, by application at the Inquiry Office, Exhibition Palace, he may be provided with the necessary pass by post.\*

I remain your obedient servant,

C. E. BAGOT,  
Secretary of the Executive Committee.

I am directed by the Executive Committee to inform you that your space is now ready for your inspection and they will feel obliged by your calling at the Inquiry Office, Exhibition Palace, when, in sending on your name, you will be admitted to the building. Such passes as may be necessary for the admission of yourself or your agent and servants will be furnished to you on application at the Office of the Superintendent of the British Department.

I am also to request that you will, without delay, proceed to occupy your space, and erect the necessary fittings.

I remain, Sir, your obedient servant,

C. E. BAGOT,  
Secretary to the Executive Committee.

#### GENERAL NOTICE.

The Executive Committee request that exhibitors will proceed with the erection of their cases and fittings without delay; no packages of any kind will be admitted after the 29th of April.

By Order of the Executive Committee.

EXHIBITION PALACE, DUBLIN,  
18th April, 1865.

#### CONTRACT FOR PROVIDING CASES, STANDS, &c., FOR EXHIBITORS.

Mr. James Beckett, 124, Stephen's-green, West, Dublin, has been appointed by the Executive Committee contractor for the supply of cases, stands, &c., at the prices mentioned in the following schedule.

Exhibitors can give their orders to Mr. Beckett direct, or through their national commissioners, agents, or consuls.

\* See Decision 10.—Tickets will be issued to every Exhibitor, his agent, or servant, to enable him to pass into the building until the 8th of May, between certain hours, to arrange the articles for exhibition. These tickets must be produced on entrance, and given up when required.

The contractor is bound not to exceed the prices stated, except for additional ornament, which must be the subject of arrangement between him and the exhibitor.

HENRY PARKINSON, Secretary and Comptroller.

No.	MAHOGANY AND PLATE GLASS COMPLETE			MAHOGANY AND 21 OZ. GLASS COMPLETE			PLAIN WOOD AND 15 OZ. GLASS COMPLETE		
	Per Article of the Dimensions in Drawing	For		Per Article of the Dimensions in Drawing	For		Per Article of the Dimensions in Drawing	For	
		Larger add	Smaller deduct		Larger add	Smaller deduct		Larger add	Smaller deduct
		Per Superficial Foot			Per Superficial Foot			Per Superficial Foot	
	£ s. d.	s. d.	s. d.	£ s. d.	s. d.	s. d.	£ s. d.	s. d.	s. d.
1	6 16 0	3 2	2 10	2 8 6	1 2	0 10	1 18 0	0 11	0 9
2	8 0 0	3 9	3 7	5 1 0	2 4	2 1	3 12 0	1 8	1 4
3	11 16 0	4 0	3 8	2 18 0	2 5	2 2	2 0 0	1 8	1 4
4	2 13 0	3 6	3 0	1 8 0	1 11	1 6	1 1 0	1 5	1 1
5	—	—	Stand	1 4 0	—	—	0 12 0	—	—
6	2 10 0	4 0	3 8	1 12 0	2 6	2 3	1 4 0	1 10	1 6
7	11 15 0	3 2	3 0	1 8 0	1 2	0 11	1 0 0	0 10	0 7
8	4 0 0	2 9	2 6	2 0 0	1 4	1 1	1 10 0	1 0	0 9

The square foot superficial, English, in which these measurements are given, is equal to 0.0929 dix millimetres.

The Committee of Advice for Class D met every alternate Friday, commencing from 13th August, 1864. They issued early the following circular letter:—

EXHIBITION PALACE, DUBLIN, ————— 1864.

We are directed by the Committee of Advice for Class D, to submit for your consideration the enclosed prospectus of the International Exhibition of 1865, and beg your kind co-operation in the carrying out of the objects set forth therein.

There is every reason to anticipate for the proposed Exhibition a large measure of success, and there is no doubt but that it will be the means of ensuring a great degree of publicity for new inventions and discoveries, as well as of bringing those of older date (which are but partially known) very prominently under public notice.

Should you be disposed to exhibit any article in one or more sections of this class, be good enough to return the enclosed form of application, filled up, at your earliest convenience.

We have the honour to be your obedient servants,

ST. JOHN BUTLER,  
PERCY FITZGERALD, } Hon. Secretaries.

FINE ARTS DEPARTMENT, CLASS F.

————— 1864.

A deputation from this department purposes waiting upon you on and in case it should be your intention to favour the Executive Committee with any paintings or other works of art, for the Exhibition, they will then afford you any information that you may desire with respect to the arrangements.

I am, your obedient servant,

WILLIAM M'KAY,  
Honorary Secretary, Fine Arts Department.

Exhibition Palace, Dublin, 29th July, 1864.

I am directed by the Executive Committee of the Dublin International Exhibition, 1865, to forward the accompanying prospectus, and to express a hope that you will further the undertaking, so far as may be in your power, by the contribution of works of art and manufactures in your possession, and if possible aid the Committee by inducing the co-operation of artists and manufacturers, so that the Exhibition may be both attractive and varied.

The Committee are especially desirous of obtaining contributions illustrative of art and manufactures from foreign countries and the colonies.

I have the honour to be your obedient servant,

HENRY PARKINSON, Secretary and Comptroller.

Exhibition Palace, Dublin.

On the occasion of the International Exhibition, to be held in Dublin during the Summer of 1865, the Executive Committee invite the co-operation of artists, collectors, and all interested in the progress of the fine arts.

The general plan of the Exhibition will be similar, as far as practicable, to that adopted at the suggestion of His Royal Highness the late Prince Consort for the Exhibition of 1851; while, in accordance with the example

F

of recent Exhibitions, the scope of the Fine Arts section will be largely extended, as an important means of varying the attractions and increasing the general usefulness of the undertaking.

In all matters connected with the organization and management of this department the Executive Committee will receive the advice and assistance of the Special Committee for this class.

The buildings—very comprehensive, and of a substantial character—are situated in ornamental pleasure grounds, within the city of Dublin; and the portion allotted to the fine art galleries has been specially designed for the reception of works of art.

Her Majesty's Government, recognising the national importance of the project, has notified it to Foreign States, through the Secretary of State for Foreign Affairs. Special Committees have been formed in the principal Continental cities, from which large assurances of support have been received; and the Society of Arts in London, to which the Exhibitions of 1851 and 1862 were eminently indebted for their promotion, have promised all possible assistance to the committee, and have sanctioned the use of their house as the chief office in London.

Every effort will be made to render the Exhibition attractive and successful, and special attention will be directed to measures for the protection and proper arrangement of the objects contributed.

Means will be taken to facilitate the sale of works of art, where such is desired by the exhibitors.

Relying on the liberal and effective aid heretofore accorded to similar undertakings, the Executive Committee solicit the temporary loan of paintings and other works suitable to the Fine Arts collection; and they request that all offers of contributions may be sent in at the earliest convenience of the persons who propose to favour them with objects for this department.

Further information may be obtained at the temporary office of the Exhibition, 112, Grafton-street, Dublin.

CHARLES E. BAGOT,

Secretary to the Executive Committee.

29th December, 1864.

#### FINE ARTS DEPARTMENT, CLASS F.

I have the honour to inform you that the Executive Committee, having been recommended by the Fine Arts Committee to avail themselves of your kind offer to place works of art at their disposal for the Exhibition, will have much pleasure in accepting those undermentioned.

Messrs. of packing and forwarding agents, will attend at such time as you may appoint, before 31st March, to pack and forward them to Dublin, at the expense of the Executive Committee. A receipt will be given for the works by the agents.

The following particulars should be supplied in order that a proper description of the works may appear in the catalogue:—

The name and address of the proprietor.

The name and address of the artist.

The subject of the work.

The class to which it belongs (as oil painting, water colour, drawing, engraving, marble, plaster, &c., &c.).

I have the honour to be yours very faithfully,

C. E. BAGOT,

Secretary to the Executive Committee.

#### WORKS OF ART,

*The property of*

SELECTED FOR THE DUBLIN INTERNATIONAL EXHIBITION, 1865.

No. of Work of Art on List	Work	Artist	Value for Insurance

The Dublin International Exhibition of Arts and Manufactures for 1865.

Exhibition Palace, Dublin, August, 1864.

SIR,

The Executive Committee are most anxious that there should be a full and creditable display of the Fine Arts in the Dublin International Exhibition of 1865.

They are favoured with the assistance of a committee for class F, and, acting under their advice, have determined to seek the co-operation of the leading artists of Great Britain and Ireland, and to invite them severally to name the works by which they would desire to be represented.

The Executive Committee trust they will meet with every disposition on the part of the artists to aid them in rendering the Fine Art department as attractive as possible.

Relying upon your kind co-operation they hope you will use your influence with the proprietors of some of your works to lend them for this national undertaking.

The Executive Committee and their officers will take every possible care of the works entrusted to them. The galleries are of a most substantial character, and being already nearly completed will be thoroughly dry before the reception of the works of art.

You will render great assistance to the committee by your kindly filling up the enclosed form, and returning same before 1st of November next.

I have the honour to be, Sir, your obedient servant,

HENRY PARKINSON, Secretary and Comptroller.

## FREE ADMISSION TO PUBLIC INSTITUTIONS

A similar letter to the following was sent to the Royal Irish Academy, Industrial Museum, Royal Dublin Society, Royal College of Surgeons, and other scientific and instructive institutions in Dublin:—

DUBLIN INTERNATIONAL EXHIBITION, 1865.

Exhibition Palace, Dublin, April 12th, 1865.

TO THE PROVOST AND SENIOR FELLOWS OF TRINITY COLLEGE, DUBLIN.

GENTLEMEN,

As it is expected that many strangers will come to Dublin this Summer to view the Exhibition, it has been suggested that their stay in the city might be rendered more agreeable, and prolonged in some degree, were greater facilities afforded for inspecting the various public institutions—and were means taken to make those facilities known to visitors.

I am, therefore, to request that you will be good enough to inform me what arrangements it will be convenient to adopt for giving admission to the Botanic Gardens, &c., in order that the Executive Committee may announce them for the guidance of visitors.

Perhaps the most suitable plan would be to admit strangers daily during the period the Exhibition will be open; and if tickets or introduction be usual, that the production of the season, railway, or excursion tickets to the Exhibition be deemed sufficient.

I have the honour to be, Gentlemen, your obedient servant,

C. E. BAGOT,

Secretary Exhibition Committee.

In consideration of the large number of strangers who were expected to visit Dublin, special facilities were afforded for the inspection of the various public institutions and many manufactories and other establishments. In most cases, the production of the season, excursion, or railway ticket sufficed to obtain admission for the visitor at any hour of the day. The authorities of the following institutions consented to this arrangement:—

ROYAL DUBLIN SOCIETY.—The Museum of Natural History, Library, and Agricultural Museum, Kildare-street; the Botanic Garden, Glasnevin.

ROYAL COLLEGE OF SURGEONS, Stephen's green, West—Museum.

TRINITY COLLEGE.—The various buildings, Library, Museum, &c.; Botanic Garden, Pembroke-road.

ROYAL IRISH ACADEMY.—Library and Museum of Irish Antiquities.

MUSEUM OF IRISH INDUSTRY, Stephen's green.

MESSRS. GUINNESS AND SON'S BREWERY, James's Gate.

And many others.

## RAILWAY ARRANGEMENTS.

The Executive Committee seeing the importance of obtaining the co-operation of the various railway and steam-packet companies, with reference to the conveyance of goods intended for the Exhibition at reduced rates, at once entered into correspondence with the boards of the different lines throughout Great Britain, especially those having direct communication with Dublin. And, at a meeting of the Railway Conference, the following resolution was passed:—

"That articles, fine arts, and goods sent from English stations for the Exhibition in 1865, be charged the full rates for conveyance to Dublin, and be returned free within a fortnight after the International Exhibition had closed, on a certificate from the Secretary that they had not been sold, but still remained the *bona fide* property of the exhibitor."

The period allowed for returning goods was afterwards extended to a month.

Attention was then directed to the necessity of obtaining some definite arrangement of through fares for the expected passenger traffic, and the Executive Committee finding it difficult to obtain anything like a satisfactory result, directed Mr. Parkinson to proceed to England, and, if possible, bring the matter before the next Railway Conference Meeting. This plan was successful, as shown by the following extract from the minutes of a meeting of the English and Irish Traffic Conference, held at the Euston Station, on the 13th December, 1864:—

Mr. W. Bradley called the attention of Conference to an application from Mr. Parkinson, for facilities to be given to parties wishing to attend the Dublin Exhibition.

After considerable discussion as to the application that had been made for special facilities to be given to a proposed excursion party from Paris to Dublin during the ensuing Summer, and as to the description of ticket to be issued at English stations to passengers visiting the Dublin Exhibition, it was

"Resolved, that the subject be referred to a sub-committee of the superintendents, parties to the Conference, to meet at Manchester in January next."

The meeting of the sub-committee took place in Manchester on the 5th of January, 1865, at which there were present:—

Mr. G. P. NEKLE,	.	.	.	London and North Western Company.
" H. BLACKMORE,	.	.	.	Lancashire and Yorkshire Company.
" W. BRADLEY,	.	.	.	Manchester, Sheffield, and Lincolnshire Company.

The following also attended the meeting:—

Mr. E. M. NEEDHAM,	.	.	.	Midland Company.
" H. PARKINSON,	.	.	.	Dublin International Exhibition.

JOHN SWAIN, Secretary.

The minute appointing the committee having been read, it was agreed to recommend the following for the approval of Conference :—

1. That a reduction of 25 per cent. be made on the return tickets between London and Dublin of through-booked passengers from the Continent, provided the continental companies and the lines south of the Thames agree to make not less than a corresponding reduction,

Mr. Neele stated that the London and North Western Company were willing to allow such through-booked passengers to travel by their Irish mail trains.

2. That the Great Eastern Company be asked to make a similar reduction on their Continental fares of passengers for Dublin, *via* Harwich—the English railway companies in connexion agreeing to extend the reduction 25 per cent. to such through-booked passengers.

3. That Mr. Neele be requested—in concert with Mr. Parkinson—to arrange with the companies south of the Thames for insertion in their coupon ticket-books of separate pages for the several routes from London to Dublin and back, in addition to coupons entitling the holders to admission six times to the Exhibition, for 4s. 6d.

4. That tourist's monthly tickets be issued from London to North Wall, Dublin, and back, by the several routes, *via* Holyhead and *via* Liverpool, at the following fares, viz. :—

First class,	.	.	.	.	£3 0s. 0d. each.
Second class,	.	.	.	.	£2 7s. 6d. each.

5. That the railway companies offer to sell, on application, at their respective stations, tickets of admission to the Dublin Exhibition—say one ticket to include six admissions, at 4s. 6d. (the price fixed by the Exhibition Committee), to every person purchasing a railway return ticket for Dublin, it being understood that the railway ticket must be produced in conjunction with the Exhibition ticket at the time of admission to the building.

6. That tourist's monthly first and second class tickets be issued at the principal provincial stations on the several railways to Dublin and back, upon a similar basis of charges.

7. That the rates of charges and the routes these passengers must travel, and the places at which they can break the journeys to and from Dublin, be considered and agreed to at the next Clearing House meeting of superintendents.

8. These tourist's tickets are to be available for the return journey for one month after the date of issue. For example, a ticket taken—say on the 6th instant—is available until the night of the 7th proximo. The time cannot be extended, and if the ticket be lost it cannot be renewed or allowed for.

9. That a system of frequent and cheap excursion trains be arranged from stations in the Yorkshire, Lancashire, and Cheshire districts, to Dublin, available for return within short periods.

10. That commencing in the month of August next, cheap excursion trains be arranged from London, and stations in the south of England, to Dublin and back, and to be continued fortnightly, if necessary; the Midland Company having agreed to join the other companies in such through-booking arrangements from their principal stations.

11. That a through-fare of 25s. per passenger, in covered carriages, for the party of 200 continental excursionists, per Minute No. 534 (472), from London to Dublin and back, by special train, allowing them to break the journey at Birmingham going, and at Liverpool and Manchester in returning.

12. That parties of not less than 100 working men, from the Continent to Dublin, be placed on the footing of excursion passengers by 3rd class train from London to Dublin and back at a fare of 21s. each.

13. It was recommended for the consideration of the Exhibition Committee—

That the holders of cheap excursion tickets shall have the privilege of obtaining two admissions to the Exhibition for one shilling, on production of their excursion tickets.

14. That special applications for admission of parties of workmen be made through the superintendents of the companies interested—Mr. Parkinson undertaking that the applications shall be liberally dealt with by the Exhibition Committee.

15. That an allowance of £5 per cent. be made by the Exhibition Committee to the several railway companies on the amount received for admission tickets, for printing, &c.—the railway companies to give every assistance in advertising the arrangements at the stations on their respective systems.

The foregoing report of sub-committee was approved of and adopted at a meeting of Conference, on the 10th January, 1865. It was laid before the Executive Committee shortly after, when the following minute was made thereon :—

EXECUTIVE COMMITTEE,

26th January, 1865.

Read and considered the minute of the Railway Conference, No. 47, January 10, 1865, with Mr. Parkinson's report thereon; and same was agreed to and adopted, subject to the following amendments :—

That to clause No. 9 be added the words, "commencing not earlier than 24th June."

And that with respect to the privileges of cheap admission, contained in Nos. 4, 5, 6, —12, 13, and 14, the Executive Committee reserve the right of withholding same during six days in the course of the season, of which ample notice will be given to the Railway Companies.

By order,

C. E. BAGOT,

Sec. Executive Committee.

The conference with the Companies South of the Thames, the North of France, Belgium, and Germany, was attended with greater difficulties and delays, not only from conflicting interests, but because some of the companies did not attach sufficient importance to an Exhibition in so distant a place as Dublin, to induce them to make any alteration in their existing arrangements. However, the following concessions were granted, but too late to be of much service to the Exhibition :—

M. Petiet, of the Chemin de fer du Nord, consented to reduce the price of return tickets from Paris 25 per cent., and also agreed to the same reduction, *via* Calais, on through tickets, from Brussels and Cologne.

The Belgian Government made a similar concession on through tickets from Brussels and Cologne, *via* Ostend.

The London, Chatham and Dover, South-Eastern, and the London and Brighton Railway Companies co-operated in this arrangement.

The Irish Companies never adopted any combined system of through rates, though the subject was brought before a Conference meeting, and discussed; nor, with the exception of two or three, did they organize cheap and frequent excursion trips, till within a few weeks of the close of the Exhibition. These proved so successful that it is to be regretted they did not co-operate with the Executive Committee at an earlier date. A great impetus was given to the excursion traffic through the exertions of many noblemen and gentlemen who sent up at their own expense their tenants and employés. As an instance, the Rev. Mr. Bagot, of Fontstown, Kildare, was the means of bringing up over 10,000 to see the Exhibition, from Carlow, Kildare, and the King's and Queen's Counties. Many of these poor people were never in Dublin before in their lives, much less at an Exhibition. This gentleman contracted with the Railway Company for their conveyance to Dublin and back by the hundred, and then distributed the tickets, by means of agents, all over the country. The annexed tabular return has been furnished by the Rev. Mr. Bagot :—

#### TABULAR RETURN OF CHEAP TRAINS TO DUBLIN

ON THE GREAT SOUTHERN AND WESTERN RAILWAY, ORGANIZED DURING THE AUTUMN OF 1865, BY THE

REV. R. W. BAGOT.

Date	Carlow, 56 Miles. Return Fares.* 1st Class 5s. 6d. 2nd Class 2s. 6d.				Athy, 45 Miles. Return Fares.* 1st Class 4s. 6d. 2nd Class 2s. 6d.				Kildare and Newbridge, 30 and 25 Miles. Return Fares.* 1st Class 2s. 8d. 2nd Class 1s. 4d.				Salford, 18 Miles. Return Fares.* 1st Class 1s. 8d. 2nd Class 9d.				Maryborough, 23 Miles. Return Fares.* 1st Class 4s. 1d. 2nd Class 2s. 2d.				Portlinton, 42 Miles. Return Fares.* 1st Class 6s. 8d. 2nd Class 3s. 10d.				Monasterivan, 35 Miles. Return Fares.* 1st Class 4s. 4d. 2nd Class 1s. 8d.				No. of Pass- engers.	Amount paid to Railway Company.	Miles travelled.	Rate per Pass- enger Mile, going and re- turning, paid to Railway Company.			
	No.	£	s.	d.	No.	£	s.	d.	No.	£	s.	d.	No.	£	s.	d.	No.	£	s.	d.	No.	£	s.	d.	No.	£	s.	d.					£	s.	d.
Sept. 21	..	..	..	..	329	36	16	104	195	12	3	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	524	42	19	104	30	8	7½		
" 28	..	..	..	..	324	30	5	74	301	20	13	9	470	17	12	6	..	..	..	..	..	..	..	..	..	..	1124	68	11	104	150	9	0		
Oct. 6	..	..	..	..	325	30	9	41	210	11	2	6	..	..	..	..	..	..	..	..	..	..	..	..	..	..	505	43	11	104	150	6	2½		
" 10	..	..	..	..	..	..	..	..	656	28	8	6	226	25	12	2	270	36	12	0	..	..	..	..	..	..	1166	80	12	8	167	11	9½		
" 13	311	30	10	0	212	21	5	74	74	50	5	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1266	116	0	74	198	11	1½		
" 17	..	..	..	..	..	..	..	..	486	19	4	0	123	20	18	7½	256	24	19	0	106	16	13	0	..	..	1131	81	5	71	137	11	10½		
" 20	305	51	9	0	227	24	1	104	444	30	0	0	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1066	100	10	104	198	10	7½		
" 24	..	..	..	..	..	..	..	..	361	15	2	5	187	22	14	9	204	20	14	9	106	12	0	0	..	..	928	70	12	5	162	14	0		
" 27	390	51	4	4	172	17	12	6	271	25	13	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	900	94	10	7	198	9	6		
Nov. 1	274	43	12	8	230	21	11	2	608	39	17	6	715	26	16	3	..	..	..	..	..	..	..	..	..	..	1937	151	17	8	204	11	3		
" 8	177	24	12	4	168	17	13	1	289	19	13	0	127	5	8	9	..	..	..	..	..	..	..	..	..	..	711	67	14	2	190	7	0		
" 23	120	18	13	0	70	7	0	7	159	12	14	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	547	38	12	9	112	6	7		
Totals...	1771	228	6	4	2056	201	1	94	3394	234	4	8	2815	112	12	5	616	69	5	64	748	71	16	9	355	28	16	0	11755	926	1	0	887	10	0
																																	Average.		

\* N.B.—The Ticket Fares mentioned above include Collectors' commission, which varied from 1d. to 2d. per Ticket.

A Railway Office was opened at the Exhibition where excursionists and return ticket holders obtained every kind of information with reference to the departure of trains, steamboats, &c., and procured check tickets to pass them into the building, which were managed as follows :—

The purchaser of a return ticket to Dublin from any of the principal stations in England, Ireland, or Scotland, had the option at the time of purchase of obtaining for 4s. 6d. a six-admission ticket to the Exhibition similar in form to the following :—

Dublin International Exhibition, 1865.
<b>ADMISSION TICKET</b>
Issued subject to the Rules and Regulations published by the Executive Committee.
Available for ONE MONTH after date of issue.
NOT TRANSFERABLE.
This Ticket entitles the holder to six admissions to the Exhibition Building during such hours as it may be open to the public. The holder must have it marked at the Inquiry Office, prior to each admission, and another ticket to pass the Turnstile will then be furnished. The Railway Ticket to Dublin must be produced on each admission to the building.

When this ticket was presented at the Railway Office in the Exhibition Building, a hole was punched between the perpendicular lines, and returned to the owner with a ticket to pass the turnstile, similar to the annexed :—

Dublin International Exhibition, 1865.
This Ticket entitles the holder to pass the Turnstile.
N.B.—This ticket must be produced to the Turnstile man together with the Railway Ticket.

When next presented a hole was punched in a second space, and a similar ticket issued, and so on until the six compartments were used up.

Excursionists, on presentation of their tickets at this office, were entitled, on payment of 1s., to two tickets of admission to the Exhibition. The following was the form of ticket :—

Dublin International Exhibition, 1865.
<b>SPECIAL EXCURSION TICKET.</b>
This Ticket entitles the holder to pass the Turn- stile once.

Excursion tickets from stations on the Dublin and Drogheda line to Dublin :—

	2nd Class.	3rd Class.
May, . . . . .	3	32
June, . . . . .	1	32
July, . . . . .	10	42
August, . . . . .	87	1,426
September, . . . . .	29	171
October, . . . . .	44	2,908
November, . . . . .	119	2,881
Totals, . . . . .	293	7,492

This does not include excursionists booked by other companies over this line.

The Dublin and Meath Railway ran fourteen excursion trains, which brought up 4,900 visitors.

The traffic on the Irish railways was increased to a very great extent. The Great Southern and Western alone gained an increase of from £12,000 to £13,000, both directly and indirectly, from the Exhibition, as may be seen from the annexed extract from the Chairman's speech at the half-yearly meeting of that Company, held on the 10th February :—

"I shall on the present occasion draw your attention to the most prominent feature of the report on which you require to get information. First of all, with respect to the increase of our passenger traffic, which amounted to about £22,000, I am sorry that we have no data to be able to give any correct information with respect to the amount of that traffic which has been derived from the increased prosperity of the country, and how much may have been derived from the extraneous source of the Exhibition. However, we may approximate to it in some

degree. The Killarney tourist traffic shows an increase of £6,000. The sum which we derived from excursion trains—and I beg your attention particularly to the word "excursion"—was between £6,000 and £7,000. The balance may fairly be divided. I think between the money derived from the Exhibition, and also from the improved prosperity of the country, there cannot be any doubt that parties were induced to come over and see the Exhibition, and afterwards prolong their journey to Killarney, and that they who passed over our lines by our ordinary trains were a source of profit. There cannot be a doubt that persons who travelled through the country along our railway by the ordinary trains were a source of profit. But I may tell you at once that it is the decided opinion of the directors of this company that if they consulted solely your interests and not the expectations and gratification of the public, they never would run an excursion train upon this line. (Hear, hear.) The worry, the expense, and the risk attendant on these trains, far more than outweigh, in our opinion, any problematical profit we may derive from. (Hear, hear.) No greater fallacy can exist in the minds of any portion of the public than the idea that increased traffic can be got without increased expenditure. To my mind it has been proved to perfect demonstration that expenditure exactly increases in proportion to receipts. Perhaps the strongest illustration I can give you of that is this:—If you take the London and North Western Railway Company, the largest railway in England, and the Great Southern and Western Railway Company, the largest in Ireland, you will find that the traffic of the London North Western Railway Company is fully four times as much per mile per week as the traffic upon this line. You will find also that the per centage of expense on the London North Western Railway Company is considerably more than the expense proportioned to the traffic of the Great Southern. If you refer to the official returns which have been recently published you will find that taking England, Ireland, and Scotland, all the different paying lines throughout the United Kingdom, that as nearly as possible the average expenditure is the same amount of per centage to the receipts—that is about 48 or 49 per cent. I think these are strong and convincing proofs that increased traffic cannot be got without largely increased expenditure. You will find such is the case with respect to our own line. We carried 29,950 excursionists, producing exactly £6,470."

Mr. Haughton's discouraging remarks, in reference to excursion trains, were fairly answered by the following letter, which appeared in the *Irish Times* of the 12th February, from the Rev. Mr. Bagot, whose excursions have already been alluded to:—

#### EXPERIMENTS IN RAILWAY REFORM.

To the Directors and Shareholders of the Great Southern and Western Railway.

Fontstown Glebe, Kildare, February 9, 1866.

GENTLEMEN,

Your company, in the month of September last, having offered to carry parties of over thirty passengers from any station on their line to Dublin and back, at the low charge of 3d. the double mile, third class; 3d. 6s., second class; and 1d. 6s., first class (these are the fares proposed by Mr. Galt for the general traffic in Ireland) with the proviso that they all went by the same train and returned by the same train, it occurred to me that an experiment might be made as to whether low fares would pay in this country.

Accordingly, I organised a number of trains from different stations, the results of which are as follow:—

Total number of passengers, 11,032. Total number of miles travelled over by trains carrying passengers both going and returning, 1,887, which, divided into the total sum paid to the railway company (viz., £936 6s. 9d.), gives an average of 10s. per mile.

On reference to the Railway Commission Blue Book, just published, it will be found, in reply to questions (4,653) in Mr. William Haughton's (Chairman Great Southern and Western) evidence, and (7,353) in Mr. Galt's evidence, they both concur in estimating the running expenses per mile of a train at 2s. 7d. Mr. Forbes' reply to question (1,609) estimates it still less—2s. 3d. Taking 2s. 7d. as a basis, it will be found that the Railway Company had £700 clear profit over and above all expenses on these trains.

You will bear in mind that these trains were running weekly from the same towns. I had no conception before of the number of people who had never been in a railway carriage—I am quite safe in saying two-thirds of our population. Now I hold it to be part of your business to educate, if I may so term it, this class of people to travel, by offering them every inducement to do so. I live within thirty miles of Dublin, and more than half of the excursionists from this neighbourhood had never before been in a railway carriage or in Dublin, and yet many of them went twice and three times afterwards by these excursion trains.

It may be said that only for the International Exhibition these trains would have been a failure. Undoubtedly the Exhibition has been a great inducement to many to go to Dublin; but so confident am I that periodical cheap trains would pay, that I have no objection, as an experiment, to guarantee your company a minimum of three hundred passengers, by a special cheap train every fortnight from the 31st of March to the 1st of November, from Carlow to Dublin and back, calling at intermediate stations up to Newbridge—or a minimum of three shillings per mile—at the fares mentioned above.

Again, it is often urged that cheap trains, though apparently profitable, are really not so, as they take away a good deal from the general traffic. My answer to this is, that business men avoid cheap trains, and no luggage is allowed with these trains. But what I conceive to be the strongest argument against this fallacy is the great increase of excursion trains on all the English lines of railway. Surely directors and traffic managers in England would not be increasing the number of excursion trains, and, at the same time, lowering the fares by them, if they did not think they paid.

In conclusion, gentlemen, I believe you altogether overlook the fact, that in Ireland the great majority of your passengers are, and ought to be, third class. You may depend upon it they are the class that ought to be encouraged, instead of, as at present, every obstacle being thrown in their way—the greatest obstacle of all the withholding from them the return ticket at a fare and a half. It is marvellous to me how such an injustice as this has been so long permitted to exist. The wealthy man—the man who can afford to pay—gets twenty-five per cent. returned to him on his double ticket fare, and the poor hard-working farmer or peasant has to pay for the double journey without any deduction. I appeal to you to do away with this injustice. Give return tickets to your third class passengers; attach third class carriages to all your trains except mail trains; and give periodical cheap trains at low fares; and I venture to predict increasing receipts and rising dividends.

I remain, Gentlemen, yours, &c.

RICHARD W. BAGOT, Clerk.

The following abstract from the speech of the Chairman (Mr Cusack) of the Midland Great Western Railway, at that company's half-yearly meeting, held on the 22nd of March, 1866, is very interesting, as it bears on the same subject, and is altogether opposed to Mr. Haughton's views on excursion traffic questions:—

The Chairman said:—In moving the adoption of the report upon this the first occasion that it has been my privilege to address you at a half-yearly meeting, I will venture to ask your kind indulgence while I make a few observations upon the state of your affairs. In the first place I will say it is my most anxious wish, as I know it to be the wish of the gentlemen with whom I am associated, that the fullest and fairest information should be given upon every matter connected with the company. (Applause.) Should there be a single point omitted by me upon which any shareholder desires information, if an intimation be given to me I will be happy to supply the information to the best of my ability. (Hear, hear.) The different chairmen who presided of late at half-yearly meetings have congratulated their shareholders upon the statements they were able to lay before them, and I see no reason whatever why I should be an exception to this rule. I do think I may claim for this company during the past half-year a share of that prosperity which seems to have characterized the railway system of this country. Though the dividend we this day purpose to give is a small one, I still think the satisfactory and progressive increase in almost every branch of our traffic, and the gradual development of the resources of our line, have gone on to such an extent as to lead us confidently to hope for better in the future. Whether I refer you to the heads of passengers, goods, or cattle, you will find a satisfactory increase. In the half-year ending the 31st of December last we carried no less than 321,308 passengers, as compared with 276,599 in the corresponding half-year of 1864, showing an increase of 44,709, while the net increase in money amounted to £7,020 4s. 7d., including the extension from Athlone to Galway. I am aware some portion of this increase may naturally be attributed to the somewhat exceptional cause of the Dublin Exhibition, but I think the directors may fairly take credit for a large amount of this increase being the result of excursion trains and other advantages which they felt it their duty to offer to the public. (Hear, hear.) Under the head of excursion trains we carried 21,179 passengers, receiving £6,180. On other lines I am aware that excursion trains have been characterized as a complete failure, while on others again, the shareholders have been told they were attended with very great expense and very great risk. I can only say *our experience leads us to characterize excursion trains as a very great success.* (Hear.) I may tell you that the judicious arrangements of our traffic manager, Mr. Skipworth—(hear, hear)—have been so admirable that we have not had to deplore a single accident. (Hear, hear.) We adopted a principle which tended to increase our profits—I am not aware whether it has been adopted on any other line—and that was, to allow the excursionists to return within a given time by any of the ordinary passenger trains, thereby affording a great boon to the holders of the excursion tickets, and a great advantage to the company in the saving of mileage. We received under that head £6,180, and the entire mileage run for it was only 2,239. I have frequently heard it laid down in this room, on high authority, that the passenger traffic of this country is a limited quantity, and that we had well nigh reached that limit; but the result of these excursion trains proves to me that this is not a true doctrine. (Hear, hear.) I will give you an instance to prove to you beyond any manner of doubt that, by the inducements the directors held out to excursionists, we obtained a great number of passengers who otherwise would never have travelled upon our line. During the progress of these excursion trains a friend of mine who travelled from Galway by one of them, and who was acquainted with every one in the district, informed me that he amused himself on the journey in passing from one carriage to another, and that no less than 270 of the passengers in that single train had never been in Dublin before. Having heard this I communicated it to Mr. Skipworth's deputy, a very excellent officer, Mr. Leybourne, who was in the habit of accompanying those excursion trains. I told him of the rather strange, but interesting inquiry of my friend, and requested him to make a similar inquiry on the next opportunity. On the 16th of October we ran from Galway to Dublin an excursion train in which there were nearly 1,500 passengers, and Mr. Seabright informed me that of those 447 had never seen Nelson's pillar before. (Hear, hear.) I think after these instances we may give up the theory that we have as yet arrived at the limit of passenger traffic in this country.

The Irish North Western Railway was the first line that made early arrangements for cheap visits to the Exhibition. It will be seen by the following statement that, besides giving return tickets at single fares from July to September, seven special excursion trains were run in October and November:—

#### IRISH NORTH WESTERN RAILWAY.

STATEMENT SHOWING THE EXCURSION ARRANGEMENTS MADE FOR THE DUBLIN EXHIBITION, 1865.

Commencing in June, 1865, and continuing during the Exhibition. Extension of time for Ordinary Return Tickets to 10 days.

1865.	July 15	Return Tickets at SINGLE FARES, available from 15th to 19th July.				
"	Aug. 14	"	at	"	"	" 14th to 17th August.
"	" 21	"	at	"	"	
"	" 28	"	at	"	"	
"	Sept. 2	"	at	"	"	
"	" 9	"	at	"	"	
"	" 16	"	at	"	"	available for Four days.
"	" 18	"	at	"	"	
"	" 23	"	at	"	"	
"	" 30	"	at	"	"	
Each Monday in Oct.		"	at	"	"	available for Seven days.
October 11, 18, and 25		Excursion Tickets at Less than Single Fares; available for Two days.				
"	19	"	at 5s. each.	Rev. Mr. Stack's Excursion.		
"	30	"	at 7s. each.	From Derry, &c.		
November . . . 3		"	at Low Fares.	From Enniskillen, &c.		
" . . . 8		"	at	From Omagh, &c.		

Ordinary Trains.

Special Trains.

The following return has been furnished by the London and North Western Railway Company, showing a considerable increase caused by the Exhibition.

## LONDON AND NORTH WESTERN RAILWAY.

STATEMENT OF NUMBER OF PASSENGERS BOOKED TO DUBLIN DURING THE FIVE MONTHS OF 1865 (JUNE TO OCTOBER), DURING WHICH THE EXHIBITION WAS OPEN.

Description of Traffic	Number Booked		1865 Increase
	1865	1864	
Ordinary traffic—Single and Return Tickets, . . . .	27,002	24,682	2,320
Tourist traffic—conveyed in ordinary trains, . . . .	4,660	Nil	4,660
Season Excursion traffic—conveyed in ordinary trains, . . . .	983	472	511
Special Excursions—conveyed in 14 special trains, as below, . . . .	3,488	982	2,506
Total, . . . .	36,133	26,136	9,997

## DATES OF SPECIAL EXCURSION TRAINS.

June 19, 1865, From Coventry.	Sept. 4, 1865, From General L. and N. W. trip.
July 24, " " General L. & N. W. trip.	" 5, " " Chester and Holyhead line.
" 25, " " Chester and Holyhead line.	" 5 & 12, " " Shrewsbury & Hereford line.
Aug. 7, " " " " "	" 18, " " General L. and N. W. trip.
" 8, " " General L. and N. W. trip.	Oct. 2, " " " " "
" 21, " " " " "	" 16, " " " " "
" 22, " " Chester and Holyhead line.	" 23, " " " " "

The Great Western Railway, of England, ran four excursion trains, by which 150 tourists travelled. The Manchester, Sheffield, and Lincoln Railway booked 656 through passengers to Dublin. No doubt a much larger number of visitors to the Exhibition came from stations on these lines, but from various causes they would not perform the whole journey at once, and would not, therefore, book through, so as to enable any record to be kept of them.

The only trips run by the Midland Railway Company for the avowed purpose of enabling passengers to visit the Dublin Exhibition were from Bristol, in connexion with the London and North Western from Birmingham, on five separate occasions, the total number of passengers travelling by them being 103.

The City of Dublin Steam Packet Company, whose magnificent mail steamers almost bridge the Irish Channel between Holyhead and Kingstown, granted a reduction in their freights in favour of the Exhibition. Their passenger receipts show, by the General Post Office return, an increase of £14,000 for the Exhibition year.

The Dublin and Glasgow Steam Packet Company availed themselves of the facilities offered by the Executive Committee, and conveyed in their boats over 2,686 excursionists at very low rates.

NOTE.—These statistics, although furnished by the Railway Companies, are hardly a criterion of the actual number of passengers, for it is well known that large numbers of visitors to the Exhibition passed over the various lines without availing themselves of excursion privileges. Without doubt the chief benefit obtained by the Executive Committee from the early co-operation of the Railway Companies of Great Britain was the great assistance afforded in the way of advertisement along the different lines.

The Committee, towards the close, were anxious to give the poorer or working classes an opportunity of visiting the Exhibition, and accordingly resolved to admit them at half price. In order that this privilege should be confined to those classes, a number of tickets were printed and distributed amongst the different trade societies, who pledged themselves that they would only be given to those for whom they were intended. The ticket was worded as follows:—

Dublin International Exhibition, 1865.
This Ticket entitles the holder to admission ONCE to the Exhibition on payment of SIXPENCE.

Soldiers and schools were admitted at half price on the terms mentioned on the annexed forms of tickets :—

<p>Dublin International Exhibition, 1865. <b>SOLDIER'S TICKET.</b></p> <p>This Ticket entitles the holder to pass the Turn- stile once.</p> <p>N.B.—A Soldier using this pass must be in uniform.</p>
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<p>Dublin International Exhibition, 1865. <b>SCHOOL TICKET.</b></p> <p>This Ticket entitles the holder to pass the Turn- stile once.</p> <p>The holder of this Ticket will not be admitted unless accompanied by the Teacher.</p>
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For the convenience of parties who might wish to treat their friends to the Exhibition, presentation tickets were issued for a similar sum to that which would have to be paid at the doors. These tickets were available on any day.

### RECEIPT OF GOODS.

The total number of packages received in the building was, up to June 1 :—

British side,	-	-	-	-	-	-	2,413
Foreign and Colonial,	-	-	-	-	-	-	2,368
Fine Arts,	-	-	-	-	-	-	972
<b>Total,</b>	-	-	-	-	-	-	<b>5,753</b>

The first British package was received on the 18th March, the first foreign on the 23rd March. Although the books were officially closed on the 1st June, packages kept dropping in, principally from the Continent and the Colonies, until September. In the Fine Arts department there were 659 cases received from abroad, and 313 from the United Kingdom.

Concessions were obtained with regard to the conveyance of goods intended for the Exhibition from the late Sir Samuel Cunard, and carried into effect through the friendly agency of the Messrs. M'Ivor and Co., of Liverpool. Mr. Allen, the Liverpool agent of the Montreal (Canadian Mail) Line, not only obtained from his Company concessions for the carriage of goods, but granted return tickets at a reduction during the period of the Exhibition, of which a large number of Canadians availed themselves. The goods from the Roman and Italian ports were brought direct to Dublin by the steamships of Messrs. Handyside and Henderson, of Glasgow, whose agents in Dublin are the Messrs. Taylor.

The Messrs. Palgrave of Dublin, conveyed, *direct* to this city, all the Belgian, Dutch, and a considerable portion of the French goods from the ports of Antwerp, Rotterdam, and Havre. The contributions from Germany and some of the Northern ports were carried by the General Steam Navigation Company, who granted *no* concessions; while the Messrs. Hartley, of London, undertook the wharfage, lighterage, and transhipment of the goods from their vessels to those of the London and Dublin, and British and Irish Company's, steam-packets, on *liberal* terms.

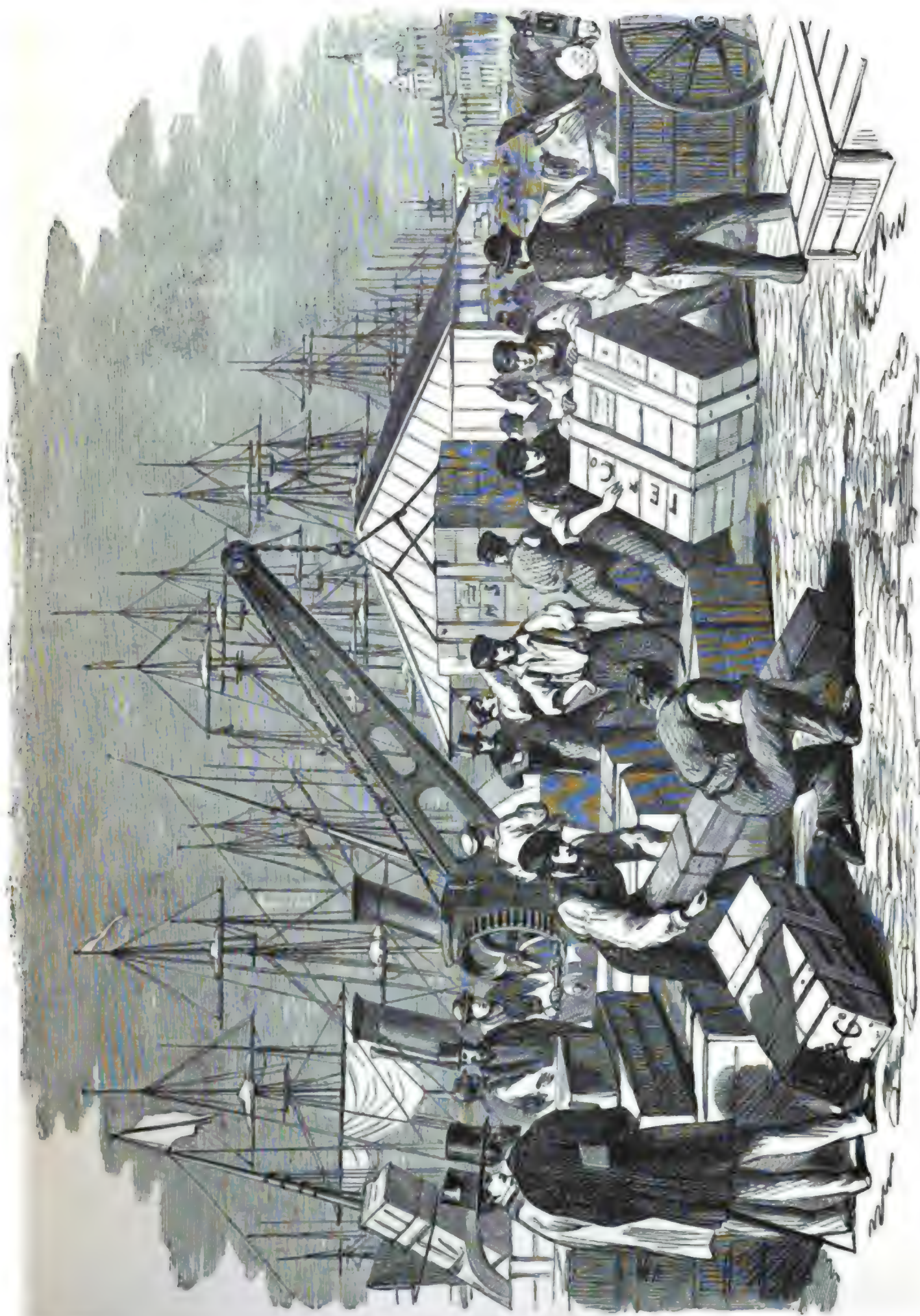
These last two named Companies made a reduction in their freights in favour of the Exhibition.

The Swedish goods and works of Art were brought over in a frigate specially commissioned for the purpose by the Government of that country.

The receipts of packages on the British side were as follows, in the weeks ending—

March 25,	-	-	-	-	3		
April 1,	-	-	-	-	25		
" 8,	-	-	-	-	97		
" 15,	-	-	-	-	231		
" 22,	-	-	-	-	321		
" 29,	-	-	-	-	679		
May 6,	-	-	-	-	544		
" 13,	-	-	-	-	89		
Carried forward,					1,939		
						May 20,	Brought forward, 1,939
						" 27,	14
						June 3,	9
						" 10,	7
						" 17,	9
						" 24,	
						July 1,	37
						Total,	2,024





LANDING OF GOODS FROM STEAMERS AT THE QUAYS, NORTH-WALL.

*Colonial Goods.*—The following return shows the date of receipt of the several cases of articles forming the collection under the charge of the Colonial and Indian Superintendents :—

1865.		1865.	Brought up, - 285
March 30, Mauritius, . . . . .	9	May 26, Canada, . . . . .	20
April 4, Nova Scotia, . . . . .	23	„ 15, Canada, 3 ; Victoria, 101, . . . . .	104
„ 5, Jamaica, . . . . .	1	June 4, Japan, . . . . .	1
„ 5, West Africa, . . . . .	1	„ 12, Canada, 3 ; Malta, 2 ; N. S. Wales, 1, . . . . .	6
„ 6, Falkland Islands, . . . . .	1	„ 16, West Africa, . . . . .	5
„ „ Ceylon, 2 ; West Africa, 2 ; Japan, 1, . . . . .	5	July 5, Bahamas, . . . . .	57
„ „ New South Wales, 1 ; New Zealand, 1, . . . . .	2	Aug. Tasmania, . . . . .	2
„ „ London contributions, . . . . .	4	„ China, . . . . .	11
„ „ Mauritius, . . . . .	2	Sept. 14, Malta, . . . . .	1
„ 3, Vancouver Island, . . . . .	1		<u>472</u>
„ 12, Natal, . . . . .	11		
„ „ Victoria, . . . . .	3		
„ „ Japan, . . . . .	2		
„ 13, West Africa, 1 ; Queensland, 1, . . . . .	2		
„ 17, Nova Scotia, . . . . .	40		
„ 18, Mauritius, 6 ; South Australia, 1, . . . . .	7		
„ „ New South Wales, . . . . .	1		
„ 19, From London, . . . . .	1		
„ „ China, . . . . .	1		
„ 20, Newfoundland, . . . . .	1		
„ 24, India, 13 ; Eastern Canada, 5, . . . . .	18		
„ 25, Japan, . . . . .	1		
„ 26, India, 2 ; Jamaica, 1, . . . . .	3		
„ 27, Sierra Leone and Lagos, . . . . .	7		
„ „ India, 8 ; China, 9, . . . . .	17		
„ 28, India, . . . . .	5		
„ 29, India, . . . . .	2		
May 1, Nova Scotia, 28 ; Canada, 35, . . . . .	63		
„ 3, India, . . . . .	3		
„ 4, Canada, 1 ; India, 7, . . . . .	8		
„ 4, Canada, . . . . .	31		
„ „ New Zealand, . . . . .	1		
„ 6, India, 2 ; Natal, 1 ; Nova Scotia, 3 ; China, 1, . . . . .	7		
„ 10, India, . . . . .	1		
	Carried up, - 285		472

220 of this number passed through the Customs returns in the building, the remainder were entered on the British side.

P. L. SIMMONDS, Colonial Superintendent.

## RETURN OF FOREIGN CASES REGISTERED BY THE CUSTOMS.

Country	March 25th to April 24th	April 25th to May 24th	May 25th to June 24th	June 25th to July 24th	July 25th to Aug. 24th	Aug. 25th to Sept. 24th	Sept. 25th to Oct. 24th	Total number of packages from each country
Austria, . . . .	74	102	1	—	—	1	10	188
Baden, . . . .	5	—	—	—	—	—	—	5
Bavaria, . . . .	15	—	—	—	—	—	—	15
Belgium, . . . .	371	8	—	—	—	—	—	379
China, . . . .	—	—	—	—	—	11	—	11
Denmark, . . . .	—	—	24	—	—	—	—	26
France, . . . .	98	234	23	14	1	—	—	370
Frankfort, . . . .	7	—	—	—	—	—	—	7
Hesse-Darmstadt, . . . .	2	—	—	—	—	—	—	2
India, . . . .	—	5	—	—	—	—	—	5
Italy, . . . .	—	457	8	18	17	—	—	502
Japan, . . . .	—	—	1	—	—	—	—	1
Malta, . . . .	—	—	2	—	—	—	—	2
Mauritius, . . . .	17	—	—	—	—	—	—	17
Natal, . . . .	—	1	—	—	—	—	—	1
Netherlands, . . . .	108	15	2	—	—	—	—	125
Nova Scotia, . . . .	63	19	—	—	—	—	—	82
Prussia, . . . .	189	65	5	2	—	1	—	262
Rome, . . . .	—	146	1	—	—	—	—	147
Russia, . . . .	—	—	—	—	—	—	—	2
Sweden and Norway, . . . .	—	—	2	—	—	—	—	36
Switzerland, . . . .	15	1	—	1	2	—	—	19
Saxony, . . . .	25	—	—	—	—	—	—	25
Victoria, . . . .	—	—	101	—	—	—	—	101
Wurtemberg, . . . .	38	—	—	—	—	—	—	38
	1,027	1,089	172	35	20	15	10	2,368

The above account embodies the number of foreign and colonial packages received by the Officers of H. M. Customs in the Exhibition building, but must by no means be held to represent the full number *received with goods for exhibition* in those departments; as, for example, Canada had 98 packages, which, having been examined at Liverpool on their arrival, did not come under the notice of the officers here. Then, again, the fine Indian collection was derived from the India Museum in London and from private collections (the 5 packages shown above excepted), from which latter source were also obtained the collections representing several Colonies and one or two foreign nations, all of which find no place in the above account.

GEORGE H. SCRIVENOR,  
H. M. C. Dub. Exhib.

Dublin, 13th November, 1865.

## CONVENIENCE AND FACILITIES AFFORDED TO VISITORS, &amp;c.

A branch Post Office was established in a central position, which afforded to visitors the same facilities with regard to postal arrangements as could be had at the General Post Office, with the exception of money orders, which were not issued.

The telegraph wires in communication with the extensive systems of the Magnetic and Electric Telegraph Companies were laid into the building, an office established, and 788 messages forwarded and received, from May 9th to December 24th.

A news and writing room was opened by Messrs. W. H. Smith and Son, which was supplied with the following newspapers and periodicals, and with all the necessary writing and reference conveniences. These were available to the public for the charge of a penny:—

## NEWSPAPERS AND PERIODICALS.

The Times  
 „ Daily News  
 „ Morning Herald  
 „ „ Post  
 „ Daily Telegraph  
 „ Standard  
 „ Star  
 „ Globe  
 „ Pall-Mall Gazette  
 „ Army and Navy Gazette  
 „ Saturday Review  
 Bell's Life  
 Punch  
 Fun  
 The Owl  
 „ Illustrated London News  
 „ „ Times  
 „ London Review  
 „ Press  
 „ Reader  
 „ Court Journal  
 Public Opinion  
 Once a Week  
 All the Year Round  
 Spectator  
 Athenæum  
 Manchester Guardian  
 „ Examiner  
 Liverpool Daily Post  
 Leeds Mercury  
 The Scotsman

Glasgow Herald  
 Irish Times  
 Saunders's News-Letter  
 Daily Express  
 Freeman's Journal  
 Evening Mail  
 „ Post  
 Warder  
 Nation  
 Belfast News-Letter  
 Northern Whig  
 Cork Constitution  
 „ Reporter  
 Limerick Chronicle  
 „ Southern Chronicle  
 Leinster Express  
 Londonderry Sentinel  
 „ Standard  
 Waterford Mail  
 Galway Vindicator

## FOREIGN NEWSPAPERS.

Journal des Debats  
 Leipzig Allgemeine-Deutsch  
 Zeitung  
 Hermann  
 La Nazione, Florence  
 Independence Belge  
 Cölnisch Zeitung  
 Le Constitutionnel  
 L'Exhibition  
 Revue des Deux Mondes

## MAGAZINES.

Edinburgh Review  
 Quarterly Review  
 Fortnightly Review  
 Dublin University Magazine  
 Frazer's Magazine  
 Blackwood's Magazine  
 Cornhill Magazine  
 St. James's Magazine  
 Shilling Magazine  
 Temple Bar Magazine  
 Macmillan's Magazine  
 Chambers' Journal  
 Falconer's Official Irish Railway  
 Guide  
 The Official Irish Railway Guide  
 Bradshaw's Continental Guide  
 „ Railway Guide  
 Maps of Ireland  
 Maps of England  
 Dublin Directory  
 „ Postal Directory  
 Writing Materials and Postal  
 Letter-Box attached to Reading  
 Room.

In addition to the above, a select stock of Guide Books and Standard Works for Tourists, Maps, Railway Guides, Magazines, and Newspapers, were kept for sale.

*Inquiry Office.*—At the Exhibition of 1853 the Committee opened an office for information at the terminus of the Dublin and Kingstown Railway, Westland-row; but in 1865 the Committee kept, at an Inquiry Office in the building, under the charge of Mr. Guy, a book in which were inscribed, for a small registration fee, the names of all those who had apartments or bedrooms to let, and the rates of charge by the night or week. This book was open, free, to the inspection of tourists and visitors arriving from England or the Provinces, and was a source of great convenience. The following official notice gives the rules and conditions laid down:—

## GENERAL INQUIRY OFFICE.

1. Books will be kept by the superintendent of the office for the registry of hotels and lodging houses.
2. Proprietors of hotels to furnish the Committee with the following particulars in writing:—Name of hotel, name of street, &c., number of beds, charges per night and week for bed and breakfast, attendance included; also charges for sitting rooms, per day and week, attendance included; and schedule of prices for dinners and refreshment.
3. Proprietors of lodging houses and furnished apartments to furnish the committee with the following particulars in writing:—Situation, street, &c., number of beds, number of bed rooms and sitting rooms, charge per night and week; also charge for bed room and partial board, attendance included.
4. Proprietors, in all cases, in order to avoid disappointment to strangers, to give a day's notice to the superintendent when they are unable to afford the accommodation as registered.
5. When complaints are made by visitors to the superintendent, of overcharge or incivility, the superintendent will direct the attention of the proprietor to the fact by letter or otherwise.
6. In case the proprietor does not give a satisfactory explanation, his or her name will be taken off the books.
7. When the accommodation turns out to be not in accordance with what has been represented on the registry, the superintendent will serve notice on the proprietor that the hotel or lodging house will be taken off the books, unless a satisfactory explanation be given.
8. Agents will attend at the North-wall and Railway Stations to afford information to strangers; said agents shall wear a uniform or badge.
9. Lists of hotels and lodging houses, with all necessary information with respect to cab fares, &c., will be prepared in the department for the use of visitors and the agents.

10. Five shillings will be charged on the first registry of hotels. A monthly renewal fee will be required for every hotel in each class, at one-half the above rate.

11. The lodging houses will be divided into three classes, according to the particulars furnished by proprietors to the Committee.

12. Proprietors of lodging houses and furnished apartments will have to pay, on registration, for each house, the fee of 5s., first class; 2s. 6d., 2nd class; and 1s. 3d., third class respectively. A monthly renewal fee will be required from each proprietor at one-half these rates.

13. In case of non-payment of the above fees, the superintendent will serve notice in each case; and if the fees are not paid before a certain date, specified in notice, the name will be taken off the registry.

14. Boarding houses will be registered, on application, on the same conditions and fees as hotels.

By Order,

HENRY PARKINSON, Secretary and Comptroller.

Visitors were not allowed to take into the sculpture hall or picture galleries any stick, umbrella, or parasol, stalls were, therefore, provided in different parts of the basement and galleries, under the charge of female attendants, where these articles could be deposited, at a charge of one penny each.

*Lost Property.*—The waifs and strays of lost property collected in a large public building of this kind are always numerous and curious; and the following list of articles found, for which no owners could be obtained, is interesting:—

A LIST OF ARTICLES WHICH REMAINED IN THE LOST PROPERTY OFFICE.

No.	Date when found	Description of Property	No.	Date when found	Description of Property
2	May 10th	Sixpence	54	June 1st	Sixpence
6	11th	Small brooch inlaid with pearls	85	"	Pair of old gloves
9	13th	Butterfly brooch with jewels	87	"	Gold locket, shape of a heart
10	"	Amber bead	88	"	Pair white kid gloves
12	"	Muslin handkerchief with lace	89	"	White veil, mourning fringe
13	"	Do. do. do.	90	"	Muslin handkerchief
14	"	Lawn do.	93	3rd	Boy's cloak and India-rubber slippers
15	"	White silk tassel	94	"	Muslin handkerchief
16	"	Lace ruffle (little value)	95	"	Linen handkerchief
18	"	Latch key	96	"	Lawn handkerchief
19	"	Fan with feathers	97	5th	Walking stick, silver top
20	"	Silk bow	98	"	Leather purse, 1s. 1½d.
21	"	Clasp for medal, gold snap	99	"	Black dotted veil
24	"	Silver locket	103	6th	Book (Daily Texts)
29	"	Leather purse	104	"	Muslin handkerchief
30	"	Old parasol	105	7th	Cane with silver top
32	"	Umbrella (gingham)	108	"	Spectacles in case
33	"	Large do. do.	110	"	Walking-stick, gold eye
34	15th	One purple kid glove (gent's)	111	"	Slate-coloured kid gloves
35	16th	Muslin handkerchief with lace	112	8th	Brass ring, watch-key, locket, and † stamp
36	"	Toy model of an engine	114	"	Fawn-coloured silk parasol
37	"	Cambric handk. marked P.A. Fry	115	"	Linen handkerchief
38	"	Black veil	117	9th	Muslin handkerchief
40	17th	Fourpenny piece	118	"	Lady's cuff
44	19th	Pencil and case (little value)	119	"	Black veil
46	20th	Old pocket handkerchief	121	"	White handkerchief
47	"	Handkerchief with lace	122	10th	Black card case
48	"	Lady's cuff	128	"	A key
50	22nd	Pair brown leather gloves	129	"	Linen cuff
51	"	Two small medals	130	12th	Brown silk parasol
52	"	Bog oak chain and ornaments	132	13th	Green-coloured glove
53	"	Cambric handkerchief	134	14th	Muslin pocket handkerchief
55	23rd	Metal locket	136	15th	Cambric handkerchief
57	"	Pair of scissors	137	"	Pair of old gloves
59	"	Pocket handkerchief embroidered	138	"	Parcel containing strips of leather
60	24th	Lady's cuff	139	16th	An old garter
61	"	White cravat	140	17th	A key
63	25th	Muslin handkerchief	141	"	Black case for spectacles
66	26th	Old pocket handkerchief	142	"	Small key
67	"	White veil	143	"	Veil with black spots
70	27th	Muslin handkerchief	144	18th	Plain handkerchief
71	29th	Pewter pint measure	150	22nd	Cambric handkerchief
74	30th	One dark kid glove	156	23rd	Do. do. with lace
77	"	Handsome steel key	158	"	Silver plated brooch
79	31st	Pebble bracelet	160	"	Black composition brooch
82	"	Cambric handkerchief			
83	"	White veil with spots			

## A LIST OF ARTICLES WHICH REMAINED IN THE LOST PROPERTY OFFICE—Continued.

No.	Date when found	Description of Property	No.	Date when found	Description of Property
162	June 24th	Pair old brown leather gloves	262	July 28th	Black leather bag
164	"	A two-shilling piece	263	29th	Pianoforte key
166	26th	Pair of old kid gloves	264	"	Leather purse and 7d.
167	"	A slate-coloured glove	265	31st	Silk parasol
168	"	A small piece of cotton lace	266	"	Black woollen shawl
169	27th	An old white handkerchief	268	Aug. 2nd	White handkerchief
170	"	Case for an opera glass	269	"	Black veil
172	28th	A pair yellow leather gloves	272	"	Pocket handkerchief
173	"	Two odd gloves	274	"	Leather bag, purse, 3s. 1d., and drinking glass
175	"	Pair steel spectacles	275	4th	Cambric handkerchief
177	30th	Brown leather glove	277	"	Plain do.
178	"	Pair slate kid gloves	278	5th	Blue necktie
179	"	Brown silk veil	280	7th	White point handkerchief
180	July 1st	Pair purple kid gloves	281	"	Small brass trinket
181	"	Silver shawl pin set with stones	282	8th	Four shillings and seven pence
183	"	Black veil with spots	284	9th	Pocket handkerchief
184	3rd	Muslin handkerchief	287	"	Silk parasol
185	"	Old pocket handkerchief	288	11th	Black figured veil
188	6th	Muslin handkerchief, flowered	289	"	Pair of eye-glasses, with steel spring
189	"	Plain handkerchief	293	14th	Brown veil
190	"	Two small keys on a ring	295	"	Brown silk parasol
191	"	Linen cuff	297	15th	Silver pencil case
194	8th	Muslin handkerchief	298	"	Blue silk tie
195	"	Leather purse	299	"	A child's book
196	"	Grey Melton coat	300	"	Catholic prayer book
198	10th	Jet brooch	301	16th	Cambric handkerchief
199	11th	Leather purse—6d. and $\frac{1}{2}$ franc	303	17th	Sixpence
203	"	Pocket handkerchief (red border)	304	18th	White handkerchief
204	"	Muslin handkerchief	306	19th	Cape collar and black brooch
205	12th	Black spectacle case	307	"	Black spotted veil
206	"	A key	308	21st	Pocket handkerchief
207	13th	Cambric handkerchief	309	22nd	Linen do.
209	"	Black spotted veil	311	23rd	Case for an opera glass
211	14th	Muslin handkerchief	313	"	Steel bead chain and two keys
212	"	Black ribbon	214	24th	Envelope containing prints
213	"	Muslin handkerchief	315	25th	Cambric handkerchief
215	15th	Blue leather purse	316	"	Muslin do.
216	"	Blue steel spectacles	319	"	Linen cuffs, and gilt buttons
217	"	Black kid glove	321	"	Belt with buckle
218	"	A duplicate ticket	322	"	Old pair kid gloves
220	17th	A small oval gold locket	324	31st	Black veil
223	"	A case of lancets	325	"	Muslin handkerchief
224	"	Muslin handkerchief	327	Sept. 1st	Two keys
226	18th	Two prints of the building	328	2nd	Silk pocket handkerchief
227	"	White veil—black spots	329	"	Purse, and £1 4s. 3d.
231	21st	Silk hat	330	5th	The streamer of a dress
233	"	Cambric handkerchief	333	6th	Three odd gloves
235	22nd	Bracelet	336	8th	Muslin handkerchief
236	"	White handkerchief	341	9th	Band for the hair
237	"	Cambric handkerchief	342	12th	An old glove
238	"	Black spotted veil	344	14th	Small key
239	"	Silk girdle, steel clasp	351	16th	Small key
240	"	Pair white kid gloves	352	18th	White veil, black spots
"	"	One do. do.	357	19th	Paper fan
"	"	One lavender glove	358	20th	A parasol (parachute)
"	"	Pair of purple silk gloves	359	"	Linen handkerchief
"	"	Cambric handkerchief (Conversazione)	360	"	Do. do.
241	"	Spectacle case	361	22nd	Brass brooch, with stone
242	"	A key	363	"	Corkscrew
244	"	Bog oak brooch	365	"	Muslin handkerchief
246	24th	Muslin handkerchief	370	26th	Linen cuff
249	25th	Black spotted veil	371	"	Muslin handkerchief
253	26th	A black kid glove	373	27th	Cotton net for hair
254	"	Silver filigree bracelet	374	"	Case for opera glass
255	27th	A damaged silver locket	376	28th	Muslin handkerchief
256	"	Old white handkerchief	377	Oct. 2nd	Alpaca umbrella
257	"	Scotch pebble bracelet	378	"	Silk parasol
258	28th	Double eye-glass (broken)	379	4th	A towel
259	"	A pocket containing two handkerchiefs, 1 $\frac{1}{2}$ d., pencil, and pair of gloves	380	"	Pair of old yellow gloves
			381	"	Leather bag

A LIST OF ARTICLES WHICH REMAINED IN THE LOST PROPERTY OFFICE—*Continued.*

No.	Date when found	Description of Property	No.	Date when found	Description of Property
384	Oct. 4th	Memorandum book	416	Nov. 6th	Black muff with white spots
385	5th	Case for spectacles	417	7th	Blue veil
388	6th	Lady's cuff	419	"	Brown do.
389	"	Pocket-book purse	421	"	Silk pocket handkerchief
390	9th	Case for an opera glass	423	8th	Leather bag and white handkerchief
392	14th	Leather purse, and 4d.	424	"	Necklace, imitation pearls
396	18th	Black spotted veil	425	"	Black veil
398	19th	Latch key	431	9th	Old muff
399	20th	Two shillings	432	"	Silver bracelet (stones), given up
400	21st	Case for an opera glass	434	11th	Do. do. given up
402	23rd	Muslin handkerchief	435	"	Silver brooch
403	"	Gilt bracelet and gloves	437	"	Muslin handkerchief
404	24th	Black veil	439	"	Case for opera glass
406	26th	An odd glove	440	"	Leather purse
407	"	Black silk handkerchief			Cloth cloak (good)
408	30th	A key			Brown coat (old)
409	"	Do.			The two latter articles left with
412	Nov. 2nd	Bog oak brooch			the umbrella stall-keeper after
413	3rd	Locket (may be gold)			the dinner in July last.

16th November, 1865.

(Sig.)

AUGUSTUS GUY, Superintendent.

## THE OFFICIAL CATALOGUE, &amp;c.

The Official Catalogue, which was sold to the public for 1s., was early taken in hand and compiled under the superintendence of Mr. C. E. Bagot, the Secretary of the Executive Committee. The first edition was ready in time for the opening day, and three revised editions were subsequently issued. The text, which embraced introduction, official directions, plans of the building, and the industrial and fine arts exhibits of home and foreign contributors, reached 201 pages, and there were 74 pages of advertisements, besides the wrapper. It was printed by Mr. John Falconer of Sackville-street, Dublin, Printer to Her Majesty's Stationery Office. Messrs. Street, Brothers, received advertisements for it in London.

The charges for advertising in the catalogue were—for the entire issue, not less than 40,000 copies:—A page, £12 12s.; half page, £7 10s.; per line, across the page, 5s.; per line, the column, 2s. 6d. For an edition of 10,000 copies:—A page, £5; half page, £3; per line, across page, 2s.; per line, the column, 1s. For the repetition of an advertisement in the next succeeding edition of 10,000 an abatement of ten per cent. was made on those charges.

The following details show the sale and returns, &amp;c.:—

## OFFICIAL CATALOGUE.

	£	s.	d.
Sold at 1s. each, 34,491, @ 1s.,	-	-	-
Sales commenced 9th May, 1865, ended 1st November, 1865.	1,724	11	0
Sold at 6d. each, 1,709, @ 6d.,	-	-	-
Sales commenced 1st November, 1865, ended 25th November, 1865.	42	14	6
Bound copies, at 2s. 6d.—18, @ 2s. 6d., 19th June, -	-	-	-
	2	5	0
Total number sold, 36,218,	-	-	-
Printed 1st Edition,	-	5,000	-
" 2nd " "	-	15,000	-
" 3rd " "	-	12,000	-
" 4th " "	-	9,000	-
	41,000		
Sold,	36,218		
Presented,	4,000		
	40,218		

## VICTORIA CROSS CATALOGUE.

Sold at 4d. each—2,378, @ 4d.,	-	-	-
Sales began 16th June, ending 18th October.	39	12	8
Sold at 2d. each—247, @ 2d.,	-	-	-
Sales began 19th October, ending 4th November.	2	1	2
Total number sold, 2,625,	-	-	-
	£41	13	10

## AWARDS OF JURIES.

	£	s.	d.
Sold at 1s. each—262, @ 1s., . . . . .	13	2	0
Sales began 3rd October, ended 23rd November.			
Sold at 9d. each—142, @ 9d., . . . . .	5	6	6
Sold at 6d. each—95, @ 6d., . . . . .	2	7	6
Total number sold, 499, . . . . .	£20	16	0
Total sale of Catalogues, . . . . .	£1,769	10	6
"    "    " Victoria Cross do., . . . . .	41	13	10
"    "    " Jury Awards, . . . . .	20	16	0
	£1,832	0	4

## RETURN SHOWING THE CATALOGUES, HAND-BOOKS, AND OTHER PUBLICATIONS ISSUED FOR, OR RELATIVE TO, THE EXHIBITION.

1. Official Catalogue—four editions—published by the Executive Committee, 8vo, 210 pp., price 1s.—John Falconer, Dublin.
2. Descriptive Catalogue of the Victoria Cross Gallery (painted by L. W. Desanges)—published by the Executive Committee, 8vo, 16 pp., price 4d.—John Falconer, Dublin.
3. Reports of the Juries and Lists of their Awards—two editions—8vo, 110 pp., price 1s.—published by the Executive Committee.—John Falconer, Dublin.
4. Notes and References Explanatory of Selected and other Paintings in the Dublin International Exhibition, 44 pp., price 3d.—M'Glashan and Gill, Dublin.
5. The Visitor's Guide to the International Exhibition of 1865, 8vo, 230 pp., with Illustrations, price 1s.—Thomas Hackett, Dublin.
6. The Cheap Guide to the Dublin International Exhibition, by P. L. Simmonds, F.S.S., Colonial Superintendent—8vo, 20 pp., with Illustrations, price 2d.—A. C. Hailes and Co., London.
7. Guide to the Exhibition, 4d. weekly, with Illustrations—Edited by John Sproule—Five Nos. issued.
8. The Comic Guide to the Exhibition.
9. Descriptive Illustrated Catalogue of the Machinery in the Exhibition, by John Sturgeon, Superintendent of Machinery—super royal 8vo, 48 pp., price 1s.—M'Glashan and Gill, Dublin.
10. Erin's Fairy Spell; or the Palace of Industry and Pleasure—a Vision—by William Scribble, Esq.—8vo, with Illustrations, and Portrait of Author.—M'Glashan and Gill, Dublin.
11. List of Articles from Sherbrook, Eastern Townships, Canada East, to the Dublin International Exhibition.—Joseph Dollard, Dublin.
12. Catalogue of the Canadian Contributions to the Dublin Exhibition, 1865—8vo, 40 pp.—Canadian Government.
13. Canada—a Brief Outline of her Geographical Position, &c.—Published by authority.—John Lovell, Quebec.
14. Canada from 1849 to 1859, by Edward A. C. Galt, Observer Office, Preston, Canada.
15. Canada—a Geographical, Agricultural, and Mineralogical Sketch, published by the Bureau of Agriculture.—*Le Canadia* Office, Quebec.
16. Notes on the Gold of Eastern Canada—by Sir W. E. Logan—8vo, price 1s.—Dawson Brothers, Montreal.
17. Report on the Trade and Commerce of Montreal for 1864—by W. J. Patterson—8vo.—Starke and Co., Montreal.
18. Practical Hints on the Culture and Treatment of the Flax Plant for the Canadian Farmer—by J. A. Donaldson—8vo.—*Globe* Office, Toronto.
19. A Handbook to Nova Scotia, prepared by direction of the Provincial Government—by Joseph Outram. 8vo.—A. Grant, Halifax, Nova Scotia.
20. Report of the Chief Commissioner of Mines for the Province of Nova Scotia for 1864.—A. Grant, Halifax, N.S.
21. Catalogue of Products from the Colony of Victoria—8vo, 16 pp.—Wilson and Mackinnon, Melbourne.
22. Statistical Summary of the progress of the Colony of Victoria for the year 1865—8vo, 24 pp.—by authority.—John Ferris, Melbourne.
23. Statistical Tables relating to the Colony of Victoria, compiled for the Dublin International Exhibition, 1865, by W. H. Archer, Registrar-General—a broadsheet.—John Ferris, Melbourne.
24. Natal: a Descriptive Account of the Colony, and a Notice of the Articles sent from thence to the Exhibition—by John Robinson, F.R.G.S., Member of the Legislative Council, Editor of the *Natal Mercury*, &c.—Robinson and Vance, Durban.
25. Official Catalogue, Kingdom of Italy, First Edition, prepared for the opening of the Exhibition, published by order of the Royal Italian Commission—large 8vo, 72 pp., price 6d.—H. Dalmazzo, Turin.
26. Official Catalogue, illustrated with engravings—Second Edition, 116 pp., price 2s. 6d.—Printing and Publishing Union, Turin.
27. (Roman Catalogue) *Elenco Generale degli oggetti spediti dagli esponenti Pontifici alla Esposizione Internazionale di Dublino*—large 8vo, 58 pp.—Rome: Tipografia della Rev. Cam. Apostolica.
28. Views of the Dublin Exhibition, with descriptive letterpress, 1s.—T. Nelson and Sons, London.

## POLICE ARRANGEMENTS.

The conduct of the visitors to the building was most orderly. Although the value of the sculpture, pictures, jewellery, and other articles exhibited was very considerable, and much loose property was lying about, in the shape of valuable glass, porcelain, leatherwork, small bronzes, and other portable articles, yet the thefts were very few. In the Colonial Department a small fur seal skin, from the walls, and a small carved ivory ornament from Japan, were taken, and from Belgium some firearms disappeared mysteriously from a glass case.

## METROPOLITAN POLICE.

The Average Number of Police employed daily within the building is shown by the following Return :—

	Inspectors	Sergeants	Acting Sergeants	Constables
From 6th March to 30th April, . . .	—	1	2	9
„ 1st May to 31st, . . .	1	1	2	24
„ 1st June to 2nd July, . . .	1	1	2	18
„ 3rd July to 27th August, . . .	1	1	2	12
„ 27th August to 19th November, .	1	1	2	15
„ 19th November to 17th December, .	1	1	1	12

The total expenses for the above were £1,144 5s. 2d.

## PRECAUTIONS AGAINST FIRE.

A small but efficient fire brigade was organized, consisting of three men in uniform, who had in turn to visit every portion of the building each hour, both day and night. The rules for their guidance were the same as those of the International Exhibition, 1862. In addition to the hydrants on the different floors of the building, with hose, &c., attached, two steam and two hand fire-engines were placed in charge of the brigade, to be used if required, by the firms of Shand and Mason, and Merryweather. Through the co-operation of Captain Ingram, superintendent of the city fire brigade, telegraphic communication was established between the building and the different fire stations in the city, whereby assistance could be obtained at once. No alarm of fire took place during the entire time of the Exhibition.

## OFFICIAL WORKING STAFF.

The permanent official staff, in addition to the Secretaries and Superintendents before mentioned, consisted of the following officers and clerks :—

## SECRETARY'S DEPARTMENT.

*Audit Office*—H. W. UPTON, Esq.

*Correspondence*—W. S. COOKE, Esq.; J. Martin, Esq.; G. P. WHEELER, Esq.

*Building*—GEORGE READ, Esq., Clerk of the Works.

*Finance*—GEORGE WALKER, Esq., Cashier; Mr. F. RAMSAY, in charge of Money Changing Office.

*Accountants*—The Firm of Messrs. BROWN and CRAIG.

*Registry, Postage, and Copying Clerks*—Messrs. HYLAND, FOGARTY, and PERCY.

**GENERAL SUPERINTENDENT'S DEPARTMENT.**—J. J. WILD, Esq., Chief Assistant and Secretary to Juries.

**BRITISH SUPERINTENDENT'S DEPARTMENT.**—Messrs. JUDKIN and MONTGOMERY, Assistants.

**FINE ARTS DEPARTMENT.**—P. W. KENNEDY, Esq., Superintendent of Sales; Mr. NAIRNE, Assistant.

## CUSTOMS.

**WILLIAM P. TOMLINS, Esq., Surveyor. G. H. SCRIVENOR, Esq., Officer in Charge. Mr. ROBERT GELLING, Mr. JOHN E. IRWIN, Mr. WILLIAM C. EGGANS, Out-door Officers. PATRICK DOWNS, Messenger.**

## RECEIVERS OF GOODS.

*British*—Mr. G. LANGTRY.

*Fine Arts*—Mr. M'CLELLAND.

*Foreign*—Mr. CARTER.

## INQUIRY AND RAILWAY OFFICE.

*Superintendent*—Mr. AUGUSTUS GUY. *Assistant*—Mr. HEALY. *Superintendent of Turnstiles*—Mr. P. CRAVEN.

*Reading and Writing Room*—Mr. BOYLAND. *Superintendent of Gardens*—Mr. BOWERS.

Under this head may be added the following:—

*Official Photographers to the Exhibition*—THE LONDON STEREOSCOPIC AND PHOTOGRAPHIC COMPANY.

*Packing and Forwarding Agents—Fine Arts*—MR. JOSEPH GREEN, 14, Charles-street, Middlesex Hospital, London; Messrs. THOMAS AGNEW and SON, Exchange-st., Manchester, Liverpool and London Chambers, Liverpool.

*Goods Carrying Agents, British Department*—Messrs FISHBOURNE, Bachelor's-walk, Dublin.

*Contractor for Cases and Fittings*—Mr. JAMES BECKETT, 124, Stephen's-green, West.

*Contractors for the Refreshment Department*—Messrs. DOUGLAS.

*Contractors for Hire of Opera Glasses*—Messrs. CHANCELLOR and SON.

### THE GENERAL EMPLOYÉS

Included—Private Police, 2. Guardians of Picture Galleries—uniform, blue and gold—6. Caretakers and Class-men of the different courts—uniform, blue and red—21. Sculpture and Pictures—men in charge, 4. Firemen, 3. Keepers of sticks, umbrellas, &c., 8. Flag caretaker, 1. Turnstile keepers, 9. Garden labourers, 6. Office messengers, 3. Clerk of Works' staff, 6. Total, 69.

### PROTECTION OF INVENTIONS AND DESIGNS.

In accordance with the precedent of the last London Exhibition, the following Act, giving protection to new inventions and designs exhibited, was passed in Parliament:—

"ANNO VICESIMO OCTAVO

"VICTORIÆ REGINÆ.

"CAP. VI.

"An Act for the Protection of Inventions and Designs exhibited at the Dublin International Exhibition for the year One thousand eight hundred and sixty five. [27th March, 1865.]

"WHEREAS it is expedient that such protection as is hereinafter mentioned should be afforded to persons desirous of exhibiting new inventions or new designs at the International Exhibition to be held at Dublin in the present year: Be it enacted by the Queen's most excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same as follows:

"1. This Act may be cited for all purposes as 'The Protection of Inventions and Designs Amendment Act, 1865.'

"2. The exhibition of any new invention at the Dublin International Exhibition shall not, nor shall the publication during the period of the holding of such Exhibition of any description of such invention, nor shall the user of such invention for the purposes of the said Exhibition, prejudice the right of any person to register provisionally such invention, or invalidate any letters patent that may be granted for such invention.

"3. The exhibition at the Dublin International Exhibition of any new design capable of being registered provisionally under the Designs Act, 1850, or of any article to which such design is applied, shall not, nor shall the publication during the period of the holding of such Exhibition of any description of such design, prejudice the right of any person to register, provisionally or otherwise, such design, or invalidate any provisional or other registration that may be granted for such design."

### FLAGS AND BANNERS DISPLAYED.

*National Flags outside the building.*—1. The Royal Standard of Great Britain and Ireland; 2. French Ensign; 3. British Ensign; 4. Royal Italian Ensign; 5. Papal States; 6. Austrian Ensign; 7. Royal Standard of Prussia; 8. Spanish Ensign; 9. Prussian Ensign; 10. Sweden; 11. America; 12. Belgium; 13. Denmark; 14. Holland; 15. Ireland; 16. Union Jack; 17. Norwegian Ensign; 18. Russia.

[The following were prepared by Thomas Phillips, Heraldic Artist, 68, Aungier-street, Dublin, by order of the Committee.]

*Within the building, British Department.*—1. Banners bearing Armorial Ensigns of the Nations having Consuls in Dublin, viz.:—Spain, Greece, Turkey, Holland, Hamburg, Bremen, Brasil, Lubeck. 2. Banners bearing the Provincial Arms of Ireland, viz.:—Ulster, Leinster, Munster, Connaught. 3. Banners bearing the Dublin City Arms and Royal Irish Academy Arms. 4. Banners bearing the Armorial Ensigns of the Guilds and Trades of Dublin City, viz.:—Merchants, Tailors, Bakers, Butchers, Shoemakers, Cooks, Founders, Tallow Chandlers, Glovers, Feltmakers, Dyers, Brewers and Maltsters.

These banners were suspended from gilded spears fastened to the apex of the pillars in the British Department by cordage of a rich golden yellow colour—the outline or shape corresponded with the Venetian bannerets; they were edged or bound all round with fringe to correspond with the cordage and tassels, and were over twelve feet long by six feet wide. They were borne by a cross-pole, having at each end a carved gilded spear, and on the field or shield was depicted the armorial bearings, either quartered or empaled, or fully bore the ensigns of the place, town, or province they represented, designed and coloured according to the rules of heraldry.

*Corporate Flags.*—Lent by the kindness of the respective Mayors, Provosts, and Corporations, in compliance with the following request from the Lord Mayor of Dublin.

MY LORD,

Mansion House, Dublin, February, 1865.

I have been requested by the Executive Committee of the International Exhibition, 1865, to inform you that active preparations are now in progress for the decoration of the building before the opening, which takes

place on 9th May next, and to express a hope that you will kindly co-operate by lending the banners representing your town and guilds of same, for the purpose of being hung up with those of other towns and corporations.

The Committee will only require the use of them during the time of the Exhibition being open, which will be for a period of six months, when they will be happy to return them safely to you, with thanks.

I am, your obedient Servant,

JOHN BARRINGTON, Lord Mayor.

19. Wolverhampton; 20. Yarmouth; 21. Bristol; 22. Stirling; 23. Manchester; 24. Limerick; 25. Belfast; 26. Dumfries; 27. Aberdeen; 28. Blackburn; 29. Glasgow City; 30. River Clyde Conservators; 31. Lincoln; 32. Northampton; 33. Edinburgh; 34. Sheffield; 35. Stockton-on-Tees; 36. Kingston-upon-Hull; 37. Southampton; 38. Worcester; 39. Dublin; 40. Shrewsbury; 41. Oxford; 42. Bradford; 43. Birmingham; 44. Berwick-upon-Tweed.

*Colonial Department.*—45. Mauritius; 46. Canada; 47. Victoria.

*In the Transit and Foreign Department.*—48. Hamburg; 49. Greece; 50. France; 51. Lubeck; 52. Hayti; 53. French Colonies, W. Indies; 54. Egypt; 55. Switzerland; 56. Japan; 57. Spanish Merchant Flag; 58. Russian Man-of-War Flag; 59. Danish Merchant Flag; 60. Austrian Merchant Flag; 61. Tunis; 62. Bremen; 63. Venezuela; 64. Russian Merchant Flag; 65. China; 66. Algiers; 67. Red Ensign; 68. Sandwich Islands; 69. America; 70. Union Jack; 71. Royal Standard; 72. French Flag; 73. Royal Italian; 74. Banneret; 75. Spain; 76. Prussia; 77. Sweden; 78. Brazil; 79. Belgium; 80. Papal States; 81. Holland; 82. Denmark; 83. Rome; 84. Austria; 85. Ireland.

### SEASON TICKETS.

The following tabular return shows the sale of season tickets, which fell considerably short of the amount realized from this source in 1853. On that occasion £14,437 11s. was received from season tickets before the opening day; and the total amount from this source was £18,238 10s.; the charges then were £2 2s. for gentlemen, and £1 1s. each for ladies and children. The visit of Her Majesty the Queen, and Court caused an additional sale of season tickets in the close of August, 1853, to the amount of about £700. In 1865 the charges for ladies and gentlemen were the same.

Table showing the Sale of SEASON TICKETS during the Exhibition.

DATE	Adults	Children	Receipts	DATE	Adults	Children	Receipts
			£ s. d.				£ s. d.
Previous to opening,	5,089	1	10,687 19 0	Brought forward,	5,487	11	11,534 5 0
May 10, . . .	14	—	29 8 0	June 19, . . .	—	—	—
" 11, . . .	65	1	137 11 0	" 20, . . .	1	—	2 2 0
" 12, . . .	47	—	98 14 0	" 21, . . .	—	—	—
" 13, . . .	32	1	68 5 0	" 22, . . .	—	—	—
" 15, . . .	27	1	57 15 0	" 23, . . .	—	—	—
" 16, . . .	26	—	54 12 0	" 24, . . .	—	—	—
" 17, . . .	15	1	32 11 0	" 26, . . .	—	—	—
" 18, . . .	19	1	40 19 0	" 27, . . .	1	—	2 2 0
" 19, . . .	9	—	18 18 0	" 28, . . .	—	—	—
" 20, . . .	14	—	29 8 0	" 29, . . .	—	1	1 1 0
" 22, . . .	20	1	43 1 0	" 30, . . .	—	—	—
" 23, . . .	10	—	21 0 0	July 1, . . .	2	1	5 5 0
" 24, . . .	15	—	31 10 0	" 3, . . .	1	—	2 2 0
" 25, . . .	8	—	16 16 0	" 4, . . .	—	—	—
" 26, . . .	14	—	29 8 0	" 5, . . .	3	—	6 6 0
" 27, . . .	6	—	12 12 0	" 6, . . .	2	—	4 4 0
" 29, . . .	4	—	8 8 0	" 7, . . .	—	—	—
" 30, . . .	11	—	23 2 0	" 8, . . .	1	—	2 2 0
" 31, . . .	8	1	17 17 0	" 10, . . .	—	—	—
June 1, . . .	3	—	6 6 0	" 11, . . .	1	—	2 2 0
" 2, . . .	2	—	4 4 0	" 12, . . .	—	—	—
" 3, . . .	6	—	12 12 0	" 13, . . .	—	—	—
" 5, . . .	3	—	6 6 0	" 14, . . .	—	—	—
" 6, . . .	1	—	2 2 0	" 15, . . .	—	—	—
" 7, . . .	4	—	8 8 0	" 17, . . .	—	—	—
" 8, . . .	1	—	8 8 0	" 18, . . .	—	1	1 1 0
" 9, . . .	1	1	3 3 0	" 28, . . .	1	—	2 2 0
" 10, . . .	2	1	5 5 0	" 31, . . .	1	—	2 2 0
" 12, . . .	2	—	4 4 0	Aug. 8, . . .	1	—	2 2 0
" 13, . . .	—	—	—	" 14, . . .	1	—	2 2 0
" 14, . . .	2	—	4 4 0	" 23, . . .	1	1	3 3 0
" 15, . . .	2	—	4 4 0	" 26, . . .	1	—	2 2 0
" 16, . . .	—	1	1 1 0	" 28,* . . .	5	—	10 10 0
" 17, . . .	2	—	4 4 0				
Carried forward,	5,487	11	11,534 5 0	Total, . . .	5,510	15	11,586 15 0

\* No more sold from this date.

The amount of business transacted in the different offices must have been very considerable if we may judge from the fact that upwards of 300,000 letters and circulars were despatched and received during the Exhibition, by far the greater number of these bearing dates anterior to the opening. Nor were the members of the several committees idle, as the annexed table shows that they shared the labours of preparation with the officials to a great degree :—

MEETINGS HELD.

Building and Works Committee,	-	-	-	-	136 times.
Executive	"	-	-	-	298 "
Finance	"	-	-	-	176 "
Committee of Advice for Class A,	Raw materials,	-	-	-	11 "
"	"	B, Machinery,	-	-	21 "
Sub-committee	"	"	B, Sect. 9, Agriculture,	-	6 "
"	"	"	C, Textile Fabrics,	-	15 "
"	"	"	D, Metallic, &c., Manufactures,	-	16 "
"	"	"	E, Miscellaneous,	-	10 "
"	"	"	F, Fine Arts,	-	18 "
To which must be added the	Traffic Committee,	-	-	-	5 "
	Reception	"	-	-	3 "
	Refreshment	"	-	-	5 "
	Music	"	-	-	6 "
Total,					726

All these, with the exception of the Executive, Finance, and Fine Arts Committees, held their final meetings before the 9th of May.

It now became necessary to make preparations for the opening of the Exhibition, and the following letter having been read by the Lord Chancellor at a meeting of the Executive Committee on the 10th March, in reply to a memorial presented by a deputation some time previously to his Excellency the Lord Lieutenant :—

The Castle, March, 9th, 1865.

MY DEAR LORD CHANCELLOR,

I have the greatest satisfaction in acquainting you that I have this morning received a letter from Lieutenant General Knollys, informing me, by desire of the Prince of Wales, that His Royal Highness proposes to visit Ireland for the purpose of being present at the opening of the Dublin International Exhibition on the 9th May. The Prince intends to arrive in Dublin on the evening of the 8th of May.

Requesting you to be good enough to bring the communication to the knowledge of your colleagues upon the committee of the Exhibition,

I remain, my Dear Lord Chancellor,

Sincerely yours,

WODEHOUSE.

A special meeting was at once summoned, and the undersigned noblemen and gentlemen were appointed as a Reception Committee :—

The Members of the Executive Committee, the Lord Mayor, the Lord Chancellor, the Duke of Leinster, the Earl of Meath, the Earl of Charlemont, Viscount Powerscourt, Sir J. J. Coghill, Bart.; Benjamin Lee Guinness, Esq., M.P.; Sir Thomas Deane, Lord James Butler, Viscount Southwell, Hon. Judge Berwick, Sir Bernard Burke, and Edmond R. Wodehouse, Esq.

To this committee were entrusted all arrangements connected with the opening ceremonial, and at their first meeting the Lord Mayor proposed the following resolution, which was unanimously adopted, viz. :—

"That the Committee have received with great satisfaction the communication conveyed to them in the letter of his Excellency the Lord Lieutenant to the Lord Chancellor, of the intention of his Royal Highness the Prince of Wales to be present at the opening of the Exhibition, and desire to express the gratification they feel on receipt of this important announcement."

This resolution his Excellency the Lord Lieutenant sent to the Prince of Wales, and at a subsequent meeting of the Reception Committee, the subjoined "Reply" was read from General Knollys :—

Marlborough House, Pall Mall, 14th March, 1865.

MY LORD,

I have the honour to acknowledge the receipt of the resolution of the Executive Committee of the Dublin International Exhibition, which your Excellency has transmitted for the information of his Royal Highness. I am directed to request your Excellency will be good enough to cause the Committee to be assured of the very great interest his Royal Highness takes in everything connected with the welfare and prosperity of the Irish people.

I have, &c.,

W. KNOLLYS.

(Signed)

To His Excellency the Lord Lieutenant.

It having been determined that a grand musical performance should form a part of the opening ceremonial, the Executive Committee, acting on the advice of the Musical Committee, voted a sum of upwards of £1,000 for the purpose, and Mr. Joseph Robinson was appointed to carry out the arrangements, which were eminently successful, and this was considered by those who were fortunate enough to be present as the greatest musical performance that had ever taken place in Ireland.\*

Tickets of invitation were sent out under the superintendence of Sir Bernard Burke to the great state officials and the leading members of the peerage; Sir Bernard also prepared the following programme of the opening ceremonial, which was adopted and submitted to his Excellency the Lord Lieutenant for the approval of the Prince of Wales, and having obtained his Royal Highness' sanction, was published by the Reception Committee:—

**FORM OF CEREMONIAL TO BE OBSERVED AT THE OPENING**  
OF THE  
**DUBLIN INTERNATIONAL EXHIBITION, 1865,**  
ON TUESDAY, THE 9TH OF MAY.

His Royal Highness the Prince of Wales, accompanied by their Excellencies the Lord Lieutenant and Lady Wodehouse, and attended by their respective Suites, will arrive at the Exhibition building at two o'clock, and will be received by the Reception Committee and conducted to the dais, the orchestra performing

THE NATIONAL ANTHEM.

When his Royal Highness and their Excellencies have taken their seats, an Address from the Exhibition Committee will be presented to his Royal Highness; and, the Prince having replied, the chorus will sing

"WITH ONE CONSENT LET ALL THE EARTH."

The Chairman of the Executive Committee will then read to his Royal Highness a Report of the Proceedings of the Committee, and present a Catalogue of the articles exhibited; after which the key of the building will be handed to his Royal Highness by the Secretary of the Exhibition Committee. The orchestra will then perform

HANDEL'S "CORONATION ANTHEM."

At its conclusion, the Right Honourable the Lord Mayor of Dublin, in his robes of office, accompanied by the members of the Corporation in their civic dresses, will present an Address from the Corporation of the City of Dublin, to which his Royal Highness will reply.

HAYDN'S "THE HEAVENS ARE TELLING"

will then be sung.

This having been concluded, the following procession will be formed, and will conduct his Royal Highness through the building:—

Contractor and Architects.  
Superintendents of the various Departments:—  
Fine Arts Colonial.  
Engineering British.  
Indian Agricultural.  
General Superintendent.  
Secretary of Executive Committee. Secretary of Exhibition Committee.  
Exhibition Committee.  
Foreign Commissioners and Representatives.  
Athlone Pursuivant of Arms.  
High Sheriff of the City of Dublin.  
Lord Mayor of York and other Mayors.  
Lord Provost of Edinburgh. Lord Mayor of London.  
Commander of the Forces. Chief Secretary for Ireland.  
Knights of the Most Illustrious Order of St. Patrick.  
Dublin Herald. Lord Chancellor. Cork Herald.  
Lord Mayor of Dublin.  
His Excellency the Lord Lieutenant's Household.  
Ulster King of Arms.  
Her Excellency Lady Wodehouse. His Excellency the Lord Lieutenant.  
His Royal Highness the Prince of Wales.  
Equerries and Aides-de-Camp.

During the procession the orchestra will perform

MEYERBEER'S GRAND MARCH FROM THE "PROPHÉTIE."

On his Royal Highness's and their Excellencies' return to the dais, the opening chorus from

MENDELSSOHN'S "HYMN OF PRAISE"

\* In order to render the performance worthy of the occasion, arrangements were made with the different Railway and Steam Packet Companies for the conveyance of performers, at excursion rates, from the following towns:—Liverpool, Manchester, Lichfield, Lincoln, Bristol, Gloucester, Worcester, Cork, Limerick, Armagh, Dundalk, Monaghan, Omagh, Sligo, Derry, Tralee, Adare, Belfast, Monrath, and the Curragh. Mr. Robinson was thus enabled to strengthen his band and chorus to a very great degree from the various choirs and orchestras of the United Kingdom.

will be given, and at its conclusion his Royal Highness will command the Ulster King of Arms to declare

THE EXHIBITION OPEN.

The declaration having been made, the opening of the Exhibition will be announced to the public by a flourish of trumpets and the firing of a Royal salute: after which will be sung

HANDEL'S "GRAND HALLELUJAH CHORUS"

and

THE NATIONAL ANTHEM;

which being concluded, his Royal Highness and their Excellencies will leave the building with the same ceremony as at their entrance, the orchestra playing

THE DANISH NATIONAL AIR.

J. BERNARD BURKE,  
Ulster.

Approved, on behalf of the Reception Committee,

2nd May, 1865.

(Signed)

M. BRADY, C. Chairman.

The doors will be opened at eleven o'clock and closed at half past one, the interval being required for making the necessary preparation for the reception of the Prince. Places will be reserved for the following classes of visitors, having Season Tickets, who will communicate, before the 5th of May, their intention of being present:—Archbishops and Bishops; Knights and Officers of the Order of St. Patrick; Peers, Baronets, and Knights; Officers of State; Privy Councillors; the Judges; Heads of Departments; Lord Lieutenants and Deputy Lieutenants; High Sheriffs of Counties; Members of Parliament; Heads of Collegiate Bodies; the Corporation; Provincial Mayors; the Committee of Advice; the Local Committees.

Those applying for reserved seats will be good enough to communicate the distinctive numbers of their season tickets.

As the period for opening the Exhibition drew near, increased activity prevailed in every department. Home, foreign, and colonial goods and Fine Arts continued to arrive every day. These had to be registered with the greatest accuracy by the receiving clerks, invoices compared and checked, and the articles assigned to their final positions by the different superintendents. The exertions made by the contractors to finish the building, and by the exhibitors to prepare their cases, &c., for the appointed day, were truly marvellous. The numerous gangs of workmen, the immense packages yet unopened, the apparent confusion, and the incessant din of hammers, seemed almost to preclude a hope of the Exhibition being ready; but when the hour came, owing to the strenuous efforts of all engaged in the work, confusion gave place to order, and all was prepared for the opening ceremonial, which, it must be admitted, was the most brilliant and successful pageant that ever took place in Ireland.

## OPENING OF THE EXHIBITION.

We take the following observations and description from the *Irish Times* of the 10th May, 1865:—

"It is with International Exhibitions as with all great events which are expected for months before they occur. There is a mingling of hope and fear, of confidence and doubt, in the feelings with which they are regarded; and it is a happy thing, both for sanguine promoters and despondent well-wishers, when the day comes round which is to decide the question of failure or success. With respect to the Exhibition of 1865 it may be safely asserted that the inauguration is to be taken as an omen of good fortune, and a fresh proof of the interest which manufacturers throughout the civilized world exhibit in those great undertakings, which are at once the evidence and the guarantee of progress—which form the arenas of friendly rivalry, and which, if they do not mould the character of nations, at least end in strengthening the bonds of kindly feeling, in bringing genius to the aid of capital, and in discovering the deficiencies and the excellence of local manufactures. It was a happy and a patriotic idea which established these arenas of honest emulation. The result has been to raise the character and the wages of the skilled workman; and though the present Exhibition may not vie with that of 1851, or 1862, in extent and splendour, there is every reason to be gratified with the results which have been attained. There is good reason to hope that the Exhibition will as far exceed that of 1853, as the latter was surpassed by other events that followed in the train of the first great International competition. Measuring the future of the undertaking by what was seen at the opening, it is impossible to refrain from expressing a belief, that not only has the building, according to its size, been more compactly and gracefully furnished than any previous structure devoted to the same purpose, but that the results will be appreciable in the increased activity of Irish manufactures. Twelve years have elapsed since Mr. Dargan made his munificent offer, and achieved the success which, notwithstanding some hindrances and losses, will always be honourably associated with his name. Great changes have taken place since that day; a new era is opening, with brighter hopes and happier auspices; the minds of men have been mightily stirred, their energies quickened, and the friendly spirit of emulation has spread its influence to the remotest countries. In the gallery of Modern British Art, which the visitor will inspect with some regret, that the genius of great contemporary painters is not more fairly represented, there is one picture which recalls the memory of that great competition which Prince Albert proposed and assisted in carrying out. The grand transept of the Crystal Palace, thronged with the beauty and fashion of the land, is depicted by the ingenious pencil of the late David Roberts, who, of all artists of our time, was best fitted to preserve the features of a scene which is connected with one of the most memorable events in English history—an event which has exercised from that day to this the most extraordinary influence upon the course of civilization. Inferior as the pageant of yesterday may have been to the

grand ceremonial, which not only inaugurated an Exhibition but marked an epoch, it had a significance which was far above the surroundings of fashion and pomp. It proved that a great example had not been forgotten, and that the interests of Ireland are better served in the field of peaceful competition than in purposeless agitation and causeless animosity. It is worse than useless to enter into argument with those who are opposed to such displays. The only mode of meeting them is an appeal to facts; and if it can be proved that enterprise has been aroused, that the sluggish have been stimulated, and that industry has found a better market, indifference and opposition will be put to the blush. That such will be the result of the new Exhibition no one doubted who saw the ceremony of inauguration.

\* \* \* \* The cheers which greeted the Prince of Wales were but a faint expression of the enthusiasm which his assistance in opening worthily a great national undertaking naturally awakened. In no conventional sense of the term it was felt to be 'a great day for Ireland'—a day to be remembered for as many years as we preserve the recollections of 1853, and possibly to exercise a more potent influence than eager sightseers could imagine or predict. His Royal Highness received the warmest welcome, not only as an acknowledgment of his high position and generous co-operation, but as the son of the august lady whose few visits to Ireland have left an impression so indelible and grateful. It is right to add here that the day was worthy of the occasion. The sun brought a Summer heat, and the cool breezes played most refreshingly amongst the crowds that had congregated in the nave, transepts, and galleries. The arrangements were carefully made and efficiently carried out, and the day was one that will never be forgotten by those who witnessed it.

*"The Gathering at the Mansion House"*—About twelve o'clock several members of the Corporation of the city, and of English Corporations, wearing their robes of office, assembled at the Mansion House, and the arrangement was that they were to proceed in carriages to the Exhibition, so that they might be there before his Royal Highness had arrived. Among those present were the following:—The Right Hon. the Lord Mayor of Dublin; the Right Hon. the Lord Mayor of York; John Waddington Mann, Esq., Under Sheriff of York; Wright Turner, Esq., Mayor of Salford; J. M. Bennett, Esq., Mayor of Manchester, and Mrs. Bennett; Robert Frost, Esq., Mayor of Chester, and Mrs. Frost; E. Lawrence, Esq., Mayor of Liverpool, and Miss Redmayne; the Right Hon. the Lord Provost of Edinburgh, in the uniform of a Deputy Lieutenant. The members of the Corporation of Dublin were:—The Right Hon. the Lord Mayor, attended by W. J. Henry, Town Clerk; the civic officers, Mr. Reynolds, City Marshal; Mr. Arkins, Sword-bearer; Mr. Crean, Mace-bearer; and Mr. Dowling, High Constable; Aldermen M'Swiney, M'Cann, Tarpey, Moylan, Laurence Reynolds, John Reynolds, Atkinson, Mackey; Town Councillors Maclean, Purdon, Meagher, Robert O'Brien, Wharton, Dr. Ryan, Dr. Carroll, Philip Redmond, William Graham, and Casson. The procession left the Mansion House at a quarter past twelve o'clock, and proceeded to the Exhibition.

*"Progress of the Prince to the Exhibition."*—It was announced that the Exhibition would be formally opened at two o'clock by his Royal Highness. Fully two hours before that time crowds of pedestrians wended their way to the Park, and long lines of carriages, cabs, and outside cars took the same route. One would have imagined that a review on a scale of great magnitude was going on in the Fifteen Acres, and that all Dublin had unanimously agreed to see it. But it was not a review. The heir to the Throne of England was about to proceed to the Great International Exhibition for the purpose of opening it. Thousands collected at the Park gate, and also in that part of the Park adjacent to the Viceregal Lodge. Precisely at two o'clock four carriages, conveying the Royal party, left the Lodge. The first three carriages contained members of the Prince's staff; and in the fourth, a close vehicle, were his Royal Highness, the Lord Lieutenant, &c. Prince George of Cambridge, Sir George Brown, Commander of the Forces, Major General Ridley, &c., were also in the procession, which was preceded and followed by squadrons of the 10th Hussars. As soon as the cavalcade cleared the gate at the Viceregal Lodge it proceeded towards the city at a pretty fast trot. It was at this moment that the drivers of cabs and carriages, and numerous equestrians attempted to form a procession. The effort to do so was rather unsuccessful. In one or two instances drivers, who attempted to cross into the line of procession and form part of it, were either put back by the Hussars or checked by the police, who did their duty most creditably. When the procession reached the Park gate the crowds occupying the green slopes, which have been formed there by the recent improvements, manifested their enthusiasm. In Parkgate-street the windows of the houses were filled with spectators. Passing the Royal Barracks it could be observed that many soldiers were on the parapet, watching the ovation in favour of their future Sovereign, whose crown and cause they would be, at a moment's notice, prepared to uphold with their lives. At this point the procession looked grand indeed. The brilliant uniform of the cavalcade—the immense multitude that thronged at every place from whence they could obtain a view of the Prince—the presence of Royalty amid a crowd of people of all classes, who vied with one another in paying respect to their future King—all these formed a sight of a most imposing character, and which rarely takes place except in honour of those who fill the highest places in the land. As the procession got into the interior of the city it became quite apparent that the crowds were growing denser and denser every moment. Windows, door and church steps, and house tops were availed of as observatories from which the Royal progress could be seen. Having passed down the quays, on the north side, the cavalcade crossed Essex-bridge into Parliament street. The demonstration here was particularly worthy of notice. From nearly all the houses banners and flags, bearing words of welcome to the illustrious visitor, were hung out. On the steps of the City Hall hundreds of people were gathered, and we believe they selected the very best site that could be had in the whole line of procession. Looking down Dame-street one could not fail to be struck with the heartiness of the reception accorded to his Royal Highness. The windows of every house in Dame street and College-green had their applauding occupants, the ladies preponderating, while the flagways on each side were blocked up with eager groups who, doubtless, would have been glad to have exchanged places with those who, comfortably seated on chairs at open windows, were enabled to cheer and wave their handkerchiefs without the danger of being pushed aside by the police, who, as we have already said, did not, so far as came under our observation, exceed their duty in any instance. Arches of flags were extended in three places across Dame street, in which thoroughfare a very fine view of the procession could be obtained. At this time the procession was considerably more than a mile in length—that is, taking into account the addition of carriages, cabs, and equestrians; and as each stride brought it nearer and nearer to its destination the anxiety to witness its arrival at the Exhibition became more and more intense. The roof of the Bank of Ireland was furnished with its quota of spectators, while inside the College railings adventurous gowmsmen placed themselves on the pedestal intended for the reception of the statue of Edmund Burke. Other gowmsmen plucked up courage enough to soar as high as Oliver Goldsmith—we mean to say that they perched themselves on the statue of the poet, and from this position uttered their cordial welcome to England's future King. According to previous announcements it was intended that the procession should go up Grafton-street, but instead of doing this it turned into Nassau-street, up Dawson-street, into Stephen's-green South

and East, and on to the Exhibition. In all the streets we have just named a right Royal welcome was accorded to the Prince. At Earlsfort terrace there was a monster meeting of the populace, who had assembled there from an early hour. The houses in Earlsfort terrace, immediately in front of the Exhibition, are few in number, but they were elegantly decorated with flags, the balconies being covered with crimson cloth, and crowded with ladies and gentlemen. A guard of the 78th Highlanders was stationed outside the Exhibition building.

"The sunlight poured through the high glass roof, and threw the more prominent features of the display into pleasant relief. It streamed over the bright flags whose shadows floated across the galleries, and wavered above the brilliant crowd that filled the transepts. All the more remarkable stands were finely displayed, and the light fell upon the splendid collection of statuary and the attractive oil paintings which occupy the Grand Hall with an effect which doubled the attraction of the place. Before ten o'clock visitors began to arrive, and from thence until one an eager throng of season ticket holders was pressing through the doors and working into the immediate neighbourhood of the dais. The dais itself was a very imposing object, erected by Messrs. Jackson and Graham, of London, at their own expense. The canopy consisted of rich mauve velvet, bound with gold. The ceiling and sides were covered with gilt paper of very elaborate designs, and the platform was richly carpeted. Long though the time seemed to be in passing, there was no appearance of impatience, and before noon the balustrades of the galleries were surrounded by elegantly dressed ladies, who were occasionally made the victims of a false alarm. But the Prince of Wales did not arrive until a few minutes after the appointed time, two o'clock. Previous to this, there had been some few signs of eager expectation, but when his Royal Highness entered, the whole aspect of the building changed as if by magic. The light flashed upon the bayonets of the 78th Highlanders as the men presented arms, and quivered along the brilliant array that lined the galleries. The faint murmur, the eager buzz of expectation, and the loud cheers followed each other, and then emerging from the nave into the transept was seen the small procession in which the Prince of Wales was the whole centre of interest and admiration. Bayonets glancing, silks rustling, cheers rising and dying away, all the signs of commotion which sway a vast assembly alternated in swift succession. At this time part of the dais was occupied by judges in their robes, military officers, splendidly uniformed and equipped, standing in groups upon the side of the dais next the French collection. They attracted all the admiration of the spectators until the Prince himself came in view. Meanwhile the Knights of St. Patrick, wearing their bright blue ribbons, ranged themselves upon the other side of the platform, together with the great Officers of the Order, prominent amongst whom were the Lord Primate, the Archbishop of Dublin, the Dean of St. Patrick's, Mr. Lowry T. Balfour, and Sir George L'Estrange. The well known figure of Lord Gough was seen amongst the crowd in the uniform of Field Marshal. The Duke of Leinster's face was easily known; and one by one, as the more distinguished members of the group moved into the front, the spectators gave tokens of recognition. All along the transept were ranged ladies in the gay attire of the season; gentlemen mounted upon the chairs strained eagerly towards the direction from which his Royal Highness was to come. But when the Prince at last appeared, and came slowly through the transept, the scene became really impressive, if not exciting, and the cheers which burst forth were almost drowned in the massive sound of the orchestra. As his Royal Highness took his seat the applause burst forth anew.

"All this time there was a constant commotion arising from the natural desire, upon the part of the spectators, to get near enough to the august spectator to hear him speak. The flutter of ribbons along the gallery, the direction of all faces suddenly to the dais, showed, as well as any noisier demonstration, the real enthusiasm which was felt. From one point, indeed, the gallery of the southern transept, the view was even more attractive. Here the London Stereoscopic Company had established their cameras, and all was in readiness until the decisive moment for taking the picture approached. From this point the view was really marvellous. Not only the shifting and animated crowd—not only the bright flags and the gaily decorated stands—came into view, but the building itself was seen to advantage, under the soft light and the pleasant air. All the magnificent symmetry, grace, and lightness of the structure were fully revealed, and the *ensemble* could scarcely have been equalled, never has been surpassed, by any exhibition interior.

"His Royal Highness was accompanied by the Lord Lieutenant and Lady Wodehouse, his Royal Highness the Duke of Cambridge, Earl Spencer, General Knollys, Major Teesdale, and Colonel Keppel. The Lord Lieutenant was attended by Mr. E. R. Wodehouse, Private Secretary; Viscount St. Lawrence, Hon. Henry Leeson, Colonel Musters, the Very Rev. Dean Graves, Captain Willis, Dr. J. S. Hughes, Dr. Hatchell, Captain Vaughan, Hon. Mr. Harbord, Captain Donaldson, A.D.C.; Captain Arkwright, A.D.C.; Captain Lascelles, A.D.C.; Captain O'Connell, A.D.C.; Mr. Wodehouse, A.D.C.; Mr. De Cetto, A.D.C.; Hon. Mr. Scott, Captain Sanderson, and the entire of the Viceregal household.

"The Prince on entering the Exhibition was received by the members of the Reception Committee, consisting of the Lord Chancellor, Benjamin Lee Guinness, Viscount Southwell, Lord James Butler, Sir Jocelyn Coghlin, Sir George Hodson, Mons. Livio, French Consul, T. Pim, J. Lentaigue, Sir R. Kane, D. Drummond, W. Foote, Sir B. Burke, Sir R. Griffith, and Maurice Brooks, who were in waiting in the Grand Entrance Hall to receive his Royal Highness. His Royal Highness wore the Ribbon of the Order of the Garter and uniform of a general officer.

"The Lord Lieutenant and Staff were attired in the Windsor uniform. Lady Wodehouse was richly attired and wore a handsome green mantle.

"On the right of his Royal Highness sat the Lord Lieutenant and the Duke of Cambridge; and on the left Lady Wodehouse. In the immediate vicinity of the throne were Earl Spencer, General Knollys, Major General Sir George Browne, Major-General Ridley, and the following Knights of St. Patrick:—The Marquis Conyngham, the Earl of Howth, the Earl of Rosse, Lord Farnham, the Earl of Granard, Viscount Gough, Lord Dufferin, and Lord Lurgan.

"At the conclusion of the National Anthem, His Grace the Duke of Leinster came forward and read the following address:—

"To His Royal Highness Albert Edward, Prince of Wales, Earl of Dublin.

"May it please your Royal Highness,

"For the distinguished honour of your Royal Highness's visit this day, we, the Exhibition Committee, desire to offer our humble thanks.

"It is difficult for us to give expression to the feelings of joy and loyal satisfaction which fill the hearts of all who throng these halls to witness the inauguration of the Dublin International Exhibition of 1865 by your Royal Highness, in the name of our beloved Sovereign. In this mark of favour and approval, we discern not alone the Queen's high appreciation of the interests of industry and art, but especially Her Majesty's gracious wish to promote the success of every enterprise which tends to advance the welfare of the Irish people.

"The act which your Royal Highness is about to perform cannot fail to remind us of the enlightened,

encouragement which the illustrious and lamented Prince Consort bestowed upon every work of usefulness, and especially upon undertakings like the present.

"International Exhibitions, bringing together the various nations of the earth, and making each better acquainted with the wants and with the resources of the rest, directly tend to stimulate industrial energy and increase commercial interchange, and thus binding all people together by the ties of mutual interest, they become in no small degree the auxiliaries of peace and progress.

"The fine arts now occupy a prominent place in International Exhibitions. The display of the best works of renowned artists opens up new sources of pleasure and delight, and forms a most important agent in the education of the people.

"We trust that the Exhibition, at whose commencement your Royal Highness so graciously presides, may prove not unproductive of such beneficial results, and that it may justify the hopes of those who, in honest labour and in self-reliant enterprise, recognise the true sources of national prosperity. We cannot conclude without expressing our heartfelt wishes for the health and happiness of your Royal Highness's illustrious Consort, whom the Irish people earnestly desire to see amongst them.

"Whenever circumstances may permit Her Royal Highness the Princess of Wales to visit our shores, which we trust will be at no distant period, we venture to promise such an enthusiastic welcome as will convey to Her Majesty and to your Royal Highness the fullest assurance of loyalty and devotion."

"His Royal Highness replied as follows:—

"My Lord Duke, my Lords and Gentlemen—I thank you for your address. It is a source of sincere pleasure to me to discharge the duties confided to me by her Majesty the Queen in thus inaugurating your Exhibition. It is not less in accordance with my own feelings than with those of her Majesty to assist in every measure calculated for the happiness and welfare of the Irish people.

"The example of my lamented and beloved parent will, I trust, ever be present to my mind as a stimulus in the encouragement of every work tending to advance international prosperity, and to develop the powers and resources of our own country. The cultivation of the fine arts, in itself so powerful an auxiliary in the civilization and refinement of the human race, has been an important object in these exhibitions, and seems already to have produced most satisfactory results.

"Believe me very sensible of your kind wishes on behalf of the Princess of Wales. Her regret at being unable to accompany me equals my own, and you may rely upon her anxiety to come amongst you, assured of the welcome she will receive."

"His Royal Highness having resumed his seat amidst loud applause, the orchestra, grand organ, and chorus burst forth with the sublime and impressive music and words of the 100th Psalm, 'With one consent let all the earth.' As the magnificent strains rolled in grandeur through the edifice they awoke feelings of the deepest awe and reverence throughout the vast assemblage. At the conclusion of the Psalm, which was splendidly given, all the voices and instrumentation blending admirably,

"Mr. Gilbert Sanders, Chairman of the Executive Committee, read the following Report:—

"The building in which we are now assembled owes its origin to the desire to supply a want which long existed in this city, that is, of a structure where the citizens might enjoy rational recreation combined with the elevating influence of the arts. A company was formed for the purpose of providing an Exhibition Palace and Winter Garden, after the model of the Crystal Palace of Sydenham, but on a scale suitable to the population of the city, and yet not discreditable to the capital of Ireland. A tract of about seventeen acres in extent, formerly known as the 'Cobourg Gardens,' lying within a few minutes' walk from the busiest centre of the city, having passed into the possession of Mr. Benjamin Lee Guinness, that gentleman, with his characteristic liberality in the promotion of all that can add to the comfort and happiness of his fellow citizens, placed the land at the disposal of the newly formed company at the price for which he had purchased it, and it was chosen as the site for the proposed buildings and garden. The design of Mr. Alfred Jones was selected as the one best calculated to meet the requirements of the company. The first stone of the building was laid in June 1863, by the then Viceroy, the lamented Earl of Carlisle, whose zeal in the encouragement of every undertaking for the benefit of Ireland, can never be too gratefully remembered by the people of this country. As the buildings advanced, their suitability for the purpose soon suggested the idea of inaugurating the new institution by holding an International Exhibition. And as nothing of that kind, on a large scale, had been attempted in Ireland since the Exhibition of 1853, the origin of which was due to the noble public spirit of William Dargan, and which had been honoured by the august presence of her Majesty, the project of an Exhibition in the present year was favourably received; but, it soon became apparent that difficulties would be encountered by a Company in accomplishing an enterprise the success of which must so largely depend on the spontaneous support of those whose sole aim is the advancement of the people in skill, knowledge, and refinement. A new organization was therefore resolved on, and the Company leased their premises at a fixed rent, for the period of the Exhibition, to an independent committee, composed of many of the nobility and other influential personages, who came forward with alacrity to lend their co-operation to so useful a project. A portion of this large committee constituted the Executive Committee, in whose hands was placed the management of the details. The precedents of former exhibitions, and especially that of 1862, have been followed as far as circumstances admitted. The objects for exhibition have been divided into six great classes—five containing the industrial products, and the sixth comprehending every branch of the fine arts. A Committee of Advice, composed of gentlemen selected for their special knowledge and fitness, took charge of each class, sought out the best specimens, so that each department should be represented in a complete and effective manner. Many members of these committees have given their time and most valuable services with a zeal and devotion to the interests of the Exhibition, which we gladly take this opportunity to acknowledge. In London the Society of Arts, so honourably associated with the history of Exhibitions, gave us their most timely and cordial support. Under the auspices of the Society the London Committee was formed, who have heartily co-operated with us, and on many important occasions have guided us by their counsels. In the capital of Scotland also, and in many of the cities and towns of the United Kingdom, committees were formed to further the objects and extend the interests of the Exhibition.

"It is needless to state that for the favour with which the undertaking has been so generally received throughout the empire we are largely indebted to the patronage of the Queen, and to the approval which her Majesty has been pleased to manifest to the Exhibition, not only by many valuable contributions from the Royal collections, but also by the special recommendations with which the Exhibition has been officially introduced to the attention of the authorities of the British colonies and of Foreign Governments by her Majesty's Secretaries of State. A large proportion of the colonies have responded to the appeal, and most of the Sovereigns of Europe, emulating the example of her Majesty, have honoured the Exhibition by their countenance, by becoming contributors, and recommending their subjects to avail themselves of its advantages. It is but just to acknowledge that the

Exhibition owes much of its attraction and its success to the cordial spirit in which Earl Russell advocated its claims to the enlightened support of Foreign Governments. Most of these Governments have deputed special representatives to attend the Exhibition, to oversee the interests of the exhibitors from their respective countries, and to aid in the selection of the jurors, who will, it is hoped, proceed early in the month of June to adjudicate upon the merits of productions which compete for the distinction of honorary medals.

"From these gentlemen we have derived most valuable assistance, and we trust that the efforts we have made to provide suitable accommodation in the building for their respective exhibitors will be found satisfactory. The space is about equally divided between the foreign exhibitors on the one hand, and those of the United Kingdom and the colonies on the other. The demand made upon us for space in the home sections was five-fold in excess of the quantity at our disposal. Hence the task of selection was difficult and embarrassing. We have remembered, however, that the Exhibition is International; and we have endeavoured, therefore, to secure what would best illustrate and represent the excellence of each country's productions. Accordingly the preference has been given to the inventor, producer, and manufacturer, over the agent or retailer. Under these circumstances it is gratifying to notice how numerous are the Irish exhibitors in very many branches of industry. No department is of greater interest in Ireland than that of machines and implements used in the cultivation of the soil. We gladly avail ourselves, therefore, of the liberality of the Royal Dublin Society, which placed at our disposal their extensive premises in Kildare-street, whereby we have been enabled to give to this important section a fuller development than to any other class of machinery. In concluding this report, we may express the hope that the Exhibition, whose preparation has cost so much labour and anxious thought, may be as prosperous in its results as it is fortunate in its commencement under the auspices of your Royal Highness."



"The Chairman of the Executive Committee then presented his Royal Highness with a Catalogue of the articles exhibited, after which the Secretary and Contoller, Mr. Parkinson, presented him with a key of the building. On the upper section of the key is a triple scroll, surmounted with a gilt crown, within the centre of which is described a harp, and on a cross bar in mediæval figures, 1865. In the upper section there is an interlacing of shamrocks, and the staff of the key is surmounted by the Prince of Wales' plume. It was enclosed in a purple velvet case, lined in marone. On the outer cover is a monogram of the Prince. The key, of which the annexed is an engraving, was manufactured and presented to the Committee for the purpose, by Chubb, of London.

"The orchestra then performed Handel's Coronation Anthem.

"At the conclusion the Right Hon. the Lord Mayor of Dublin, in his robes of office, accompanied by the Secretary, Mr. Wharton, and civic officers, and the following members of the Town Council, advanced to the throne to read an address:—Alderman Moylan, Alderman Atkinson, Alderman M'Swiney, Mr. P. Redmond, T.C.; Mr. Gavagan, T.C.; Mr. Graham, T.C.; Mr. Whelan, T.C.; Mr. Mackey, T.C.; Alderman Durdin, Mr. Purdon, T.C.; and Mr. D'Arcy, T.C.

"The Lord Mayor read the address as follows:—

"May it please your Royal Highness—We, the Lord Mayor, Aldermen, and Burgesses of Dublin, take the earliest opportunity of welcoming most heartily your Royal Highness on your arrival in this city, and of conveying the assurance of our undiminished loyalty to our most gracious Sovereign the Queen of Great Britain and Ireland.

"Whilst we have learned with no little regret that the visit of your Royal Highness must at the present be very limited, yet we hail the advent of your Royal Highness as an omen that this portion of the Queen's dominions may more frequently be honoured by the presence of royalty, and that we may look forward to a period not, as we hope, far distant, when your Royal Highness may return in company with her Royal Highness the Princess of Wales, who is still a stranger to Ireland except by fame.

"The occasion which induced your Royal Highness to visit Ireland—the opening of the International Exhibition—is one which must be interesting to your Royal Highness as the son of the ever-to-be-lamented Prince Consort, to whose wisdom, energy, and influence such Exhibitions owe their origin. We trust that the undertaking which your Royal Highness will this day inaugurate, may prove of special interest as a means of stimulating industry, developing the resources, and promoting the abiding welfare of Ireland, so that when in the far off course of time your Royal Highness shall no longer be a subject, you may reign over a happy and contented people."

"The Lord Mayor handed the address to his Royal Highness, who replied as follows:—

"My Lord Mayor, Aldermen, and Burgesses of the City of Dublin—I return you my hearty thanks for the kind welcome you have given me, and for your loyal expressions towards her Majesty the Queen. I regret that circumstances should prevent the extension of my visit to a longer period.

"It would have been very gratifying to the Princess had she been able to accompany me, and I request that you be assured that we look forward to another occasion when she will have the opportunity of appreciating the hearty welcome which my own experience leads me to anticipate for her.

"You justly ascribe to me a peculiar interest in this day's ceremony. As the son of that revered and lamented parent, to whose wisdom, energy, and influence you truly state Exhibitions such as these owe their origin, I may well feel proud in being able to assist at the inauguration of the one we are about to open.

"May your prayers be granted that it will be the means of producing the usual result attending well-directed labour, and conduce to the prosperity of Ireland and to the happiness of her people."

"The address was splendidly illuminated in the studio of Mr. J. Hopkins, 39, Great Brunswick-street, and was a magnificent specimen of Irish art and skill. It was surmounted by the Prince's feather, badge, and motto. A flowing scroll border, in which brilliant colouring blended harmoniously, surrounded the address.

"When his Royal Highness resumed his seat, the orchestra performed the sublime composition 'The Heavens are Telling.' The great feature in the ceremonial now commenced in the formation of the procession which proceeded from the centre of the nave in the following order:—

"Contractors and Architects—Messrs. Beardwood, T. A. Jones, Esq., and F. Darley, Esq.  
Superintendents of the various departments—Fine Arts, H. E. Doyle, Esq.; Indian, Dr. J. Forbes Watson, and Captain Meadows Taylor; Colonial, P. L. Simmonds, Esq.; British, T. A. Wright, Esq.; Agricultural, A. Corrigan, Esq.; Engineering—John Sturgeon, Esq.

General Superintendent—J. F. Iselin, Esq.

Secretary of the Exhibition—H. Parkinson, Esq.

The Exhibition Committee—The Lord Chancellor of Ireland, the Duke of Leinster, the Earl of Meath, the Earl of Charlemont, the Earl of Howth, the Earl of Rosse, F.R.S.; the Marquis of Drogheda, the Earl of Clancarty, the Earl of Lucan, Viscount Gough, Viscount Powerscourt, Lord Talbot de Malahide, F.R.S.; Lord Anally, the Marquis of Kildare, Sir Robert Shaw, Bart.; Gilbert Sanders, Esq., M.R.I.A.; F. W. Brady, Esq., Q.C., D.L.; Sir Edward Grogan, Bart., M.P.; Sir Percy Nugent, Bart.; Sir J. J. Coghill, Bart.; P. P. M'Swiney, Esq., Ex-Lord Mayor; Sir Thomas Deane, Sir Bernard Burke; Hon. Judge Berwick; Hon. St. John Butler; Hon. J. P. Vereker; the Right Hon. Alex. M'Donnell; Right Hon. the Attorney-General for Ireland; Right Hon. Mr. Justice O'Hagan; Major-General Colomb; J. E. Vernon, Esq., D.L.; B. L. Guinness, Esq., D.L.; Henry Andrews, Esq.; William M'Kay, Esq.; Catterson Smith, Esq., P.R.H.A.; G. F. Mulvany, Esq.; Major-General Sir Thomas Larcom, K.C.B.; Sir Ralph Howard, Bart.; Maurice Brooks, Esq.; William Dargan, Esq., D.L.; David Drummond, Esq.; William Foot, Esq., J.P.; John Fry, Esq.; Sir Richard Griffith, Bart.; Sir G. F. J. Hodson, Bart., D.L.; Sir Robert Kane, F.R.S.; William R. Le Fanu, Esq., C.E.; J. Lentaigue, Esq., J.P., Inspector-General of Prisons; Thomas Pim, Esq.; William R. Stephens, Esq.; John W. Switzer, Esq.; Thomas Vance, Esq., J.P.; Mons. George Livio, French Consul; Signor Aug. C. Marani, Italian Consul; William Gardner, Esq.; Hercules Macdonnell, Esq.

Colonial Commissioners.

Foreign Commissioners and Representatives.

Athlone Pursuivant of Arms.

High Sheriff of the City of Dublin, J. Boyce, D.L.

Mayors of Cork, Waterford, Liverpool, Londonderry, Manchester, Sunderland, and Salford.

Lord Mayor of York.

Lord Provost of Edinburgh.

Lord Mayor of London.

General Sir George Brown, Commander of the Forces.

Chief Secretary for Ireland.

Knights of the Most Illustrious Order of St. Patrick.

Dublin Herald.

Lord Chancellor.

Cork Herald.

Lord Mayor of Dublin.

His Excellency the Lord Lieutenant's Household.

Sir Bernard Burke, Ulster King of Arms.

Her Excellency Lady Wodehouse.

His Excellency the Lord Lieutenant.

His Royal Highness the Duke of Cambridge.

His Royal Highness the Prince of Wales.

Equerries and Aides-de-Camp.

"The procession moved on in the order stated, the orchestra meanwhile performing Meyerbeer's Grand March from *Le Prophete*. His Royal Highness first passed along the nave to the stair leading to the gallery, from which he entered the chamber allotted to British artists, then the foreign gallery, and afterwards, passing along the east gallery, returned through the corridor, and having viewed the collection of water colours and the Victoria Cross exhibition, proceeded through the grand collection of statuary in the Entrance Hall to the dais, at which he directed Sir Bernard Burke to declare the EXHIBITION OPEN. This declaration having been made, signal rockets were discharged, and immediately salutes were fired from the Pigeon-house, the Magazine in the Park, and H.M.S. Royal George in Kingstown Harbour. As the Prince of Wales left the building the three military bands played the Danish National Air, under the direction of Mr. Smalley.

"Concerning the music performed at the opening of the Exhibition, nothing could be spoken save in the way of praise. It was really a wise step to procure the services of such a musician as Mr. Joseph Robinson, and it may well be questioned whether a finer chorus of five hundred voices has ever been assembled or trained. This was specially manifested in the magnificent rendering of the 100th Psalm, the two first verses in harmony and the third in unison accompanied. The orchestra made up the number of performers to nearly a thousand, and performed its duty with remarkable purity and completeness. This was admirably displayed in Handel's magnificent Coronation Anthem, and in Mendelssohn's glorious 'Hymn of Praise.' Haydn's chorus, 'The Heavens are Telling,' was never rendered in Dublin with such force, unity, and sympathetic grace. Nor did the famous 'Hallelujah Chorus' ever ring out with such vigour and telling effect. It was a triumph of musical skill to conduct so vast a number of performers with such ability, that not the slightest error or hesitation occurred throughout the whole of the musical programme. It is only just to say that in making the arrangements Mr. Robinson received important assistance from Mr. John O'Rourke, whose experience and good taste are extremely valuable on such occasions. The military bands present were those of the 5th Dragoon Guards, under Mr. Lee; the 11th Hussars, under Mr. Fitzpatrick; and the 78th Highlanders, under Mr. Smalley. Mr. Henry Distin, of London, lent for the occasion the biggest drum in the world, which consists of a buffalo skin eight feet in diameter, stretched upon a frame consisting of 450 pieces of wood. This splendid instrument was played with admirable skill by Robert Hughes, drummer of the 11th. In the march from *Le Prophete* and in the 'Danish National Air' it produced a remarkable effect."

## THE BALL AT THE MANSION HOUSE.

A ball, in honour of the visit of his Royal Highness the Prince of Wales, was given by the Lord Mayor, on the evening of the 9th May, at the Mansion House, Dawson-street. The entire suite of rooms, thrown open for the occasion, barely sufficed to accommodate the vast numbers who had received invitations. There could not have been less than three thousand persons present. The company continued to arrive up to two o'clock in the morning. The rooms were brilliantly decorated, and arranged, especially the King's Room, the decorations of which, by Strahan and Co., of Henry-street, were of a superior description. A dais was prepared for the reception of the Prince and the other distinguished guests. The room was brilliantly lighted, and immediately in front of the dais were represented the plumes and initials of the Prince of Wales in crystal lights, which produced a very pleasing effect.

His Royal Highness arrived at half-past eleven o'clock. He was escorted from the Viceregal Lodge by a troop of the 10th Hussars, and at the Mansion House a guard of honour of the 10th Foot was drawn up. His Royal Highness was accompanied by their Excellencies the Lord Lieutenant and Lady Wodehouse, the Duke of Cambridge, Earl Spencer, K.G.; General Knollys, Major Teesdale, Colonel Keppel, and Lord Dufferin, K.G. Mr. Wodehouse, Private Secretary, and the entire of the Viceregal Staff were in attendance. On his arrival at the Mansion House H.R.H. was received by the Right Hon. the Lord Mayor, the civic officers, his Grace the Duke of Leinster, the Marquis of Kildare, Rear-Admiral Frederick, and a number of naval and military officers. On the Prince's entrance into the Round Room, the band, under the direction of Mr. Hardy, played the National Anthem. A space in front of the dais was reserved for his Royal Highness and the principal visitors. Dancing immediately commenced, with the aid of an admirable programme, including "The *Irish Times* Galop" and other selections well suited to the occasion. The Prince heartily joined in the spirit of the dance. He opened the ball with Lady Wodehouse, having for his *vis-à-vis* the Lord Lieutenant and the Marchioness of Drogheda, and in the same set were the Duke of Cambridge, the Earl of Howth, Lady Charlemont, Lord St. Lawrence and the Lord Mayor. His Royal Highness subsequently danced with Lady Alice Hill, the Countess of Charlemont, and other ladies of distinction. After supper, which was provided by Messrs. Reynolds and Marsh, dancing was resumed, and was sustained with unabated vigour until the Prince retired at twenty minutes past two o'clock. He was escorted to the Viceregal Lodge by a troop of the 10th Hussars. The ball was, perhaps, the most brilliant which has taken place at the Mansion House for many years, and will long be remembered in connexion with the visit of the Prince of Wales. Amongst the many guests present were:—

Their Excellencies the Lord Lieutenant and Lady Wodehouse, the Duke of Leinster, the Marquis and Marchioness Conyngham, the Marquis and Marchioness of Drogheda, the Marquis and Marchioness of Kildare, Lord Chancellor, Mrs., and Miss Brady, Lord James and Lady Rachel Butler, Earl and Countess of Charlemont, Earl of Clancarty and Ladies Trench, Lord Gough, Earl and Countess of Granard, Lord Henry Loftus and Countess of Seafeld, Earl and Countess of Longford, Earl of Lucan, Lord and Lady Oranmore, Earl and Countess of Rosse, Earl of Huntingdon, Lord Cloncurry, Earl Spencer, Lord Hastings, Viscount and the Viscountess Gormanston, Viscount and the Misses Southwell, Lord Charles T. Scott, Lord and Lady George Hill, Mr. A. and Miss C. Hill, Sir George and Lady Forster, Sir Patrick, Lady, and Miss Grant; Sir B., Lady, and the Misses M'Mahon; Sir James, Lady, and the Misses Power; Sir T. and the Misses Ross, Sir C. O'Loughlen, Sir J. and Lady Arnott, General Sir George Browne, Sir B. and Lady Burke, Lady Arabella and Miss Brooke, Sir Robert Gore Booth and Miss Booth, Hon. M. de Montmorency, Dean of Chapel Royal and Mrs. Graves, Sir Robert Kane and Lady Kane, Sir George and Lady Foster, Sir Thomas and Lady Fetherston, Sir Edward Grogan, Sir R. Griffith, Sir John and Lady Gray and Miss Gray; Sir Robert and Lady Hart, Hon. George and Mrs. Handcock, Lord Hastings, Sir Gilbert and Lady King, Hon. Henry Leeson, Major-General Sir T. and Lady Larcom, Lord and Lady Lurgan, Earl of Erne, Lady, Mr., and Mrs. McDonnell; Sir Percy and the Misses Nugent, Hon. Thomas Preston, Lieutenant-General Knollys, Mr. Herbert Fisher, Private Secretary to his Royal Highness the Prince of Wales; Lieutenant-Colonel Keppel, Major Teesdale, Equerries to his Royal Highness the Prince of Wales; Sir John, Lady, and Miss Ribton; Sir William and Lady Wilde, Lady O'Donnell, Alderman Atkinson, Mr. John T. Armstrong, Sergeant and Misses Armstrong, and Miss M'Dowell; Mr. and Mrs. Henry Andrews, Mr. and Mrs. George Andrews, Mr. and Mrs. Arthur Andrews, Mr. and Mrs. J. Adair, Lieutenant-Colonel Adamson, the Lord Justice of Appeal and Mrs. Blackburne, and Mrs. G. Daniel; Major Lyttleton Annesley, 11th Hussars; Mr. Thomas M. Archer, Mr. and Mrs. Allen, the Attorney-General and Mrs. Lawson, and Miss Merrick; Lieutenant Henry Arkwright, A.D.C.; Cornet Viscount Adare, A.D.C.; the Archdeacon of Dublin, Mr. and Miss Lee; Mr. Thomas, Mrs., and the Misses Alley; Mr., Mrs., and Miss Ayre; Captain, Mrs., and Miss Gertrude Allen; Mr. and Mrs. Acheson; Mr. and Mrs. Allen, Mr. Henry Alexander, Mr. and Mrs. Apjohn, Mr. Alfred Alexander, Mr. George Alley, Messrs. Anderson and Lee, Miss Armstrong and Mr. Collins, Mr. Edward Armstrong, Mr. Lowry Balfour, the Hon. Captain Boyle, A.D.C.; Mr., Mrs., and Miss Howard Brooke; Mr., Mrs., and the Misses Boulton; Mr. and the Misses Brereton, Mrs. and Miss Blake, Mr., Mrs., and Miss Blake; Captain and Mrs. Blake; Major and Mrs. Blygh, Mr. and Mrs. G. Bushe, Mr. Barry, Q.C., and Mrs. Barry; Messrs. Brooke, Mr., Mrs., the Misses, and Mr. H. Browne; Mr. C. E. Bagot, the Mayor of Belfast, Mr. Blake, Q.C., Mrs., and Miss Blake; Messrs. J. and C. Brien, Mr. J. J. Butler, jun.; Mr. W. C. Bailey, Mr. W. H. Beale, Mr. and Mrs. Barry, Mr. and Mrs. R. Bradley, Mr. and Mrs. Bagley, Mr. Burne, Mr. Bewley, Mr. Bennett, Mr. Brennan, Mr. J. B. Beale, Mr. John F. Bewley, Mr. Alexander Boyce, Mr. and Mrs. G. F. Barry, Colonel, Mrs., and Miss Bingham; Monsieur Boissevain, Mr. W. S. Brewere, Mr. William Bunbury,

Mr. Blenerhassett and Miss Wyndham, Dr. Mrs., and Mr. Barry; Mr. W. and the Misses Bruce; Mr. Beatty, Mr. Bennett, Mr. Burke, Mr. Brereton, Q.C.; Miss G. Bell, Mr. J. Boyce, Mr. E. Bewley, Mr. W. H. Bewley, Mr. Browning, Lieutenant J. D. Bourne, 5th Dragoon Guards; Cornet Browns, 5th Dragoon Guards; Mr. Butler, 78th Highlanders, and Mrs. Butler; Mr. William Boyd, Mr. and Mrs. St. John C. Bolland, Mr. Spey, Mr. Owens, Mr. and Mrs. Burke, Mr. and Mrs. O'Connor, Mr. J. and Miss Bewley, Mr., Mrs., and Miss Barry, Mr. Barry, junior; Mr. Erasmus Barrington, Herr Peter Bender, Mr. and Mrs. Bourke, Mountmellick; Mr. and Mrs. Carey, and Mr. H. Carey, junior; Dr. and Mrs. Collis, Mr. Caldbeck, Mr. Colville, Mr. and Mrs. J. Crotty, Captain Knox, Miss Knox, and John Ethelred Knox, Esq.; Alderman, Mrs., and Miss Campbell; Dr., Mrs., and Miss Churchill; Dr., Mrs., Mr. J. and the Misses Carroll; Mr. and Mrs. W. Carte, Mr. H. S. Close, Mr. R. B. Close, Mr. S. H. Close, Mr. and Miss C. Copeland, Mr. and Mrs. J. C. Coffey, Mr. Carey, T. C., Mrs., and Miss Carey; Mr. and Mrs. J. Cox and Miss Reedy; Dr. and Mrs. Cameron, Mr. Corry Connellan, Mr. George, Mrs., and Miss Campbell; Mr., Mrs., and the Misses Adye Curran; Mr. W. J. Corbett, Major-General, Mrs., and Miss Cooper; Mr. Cogan, M.P., and Mrs. Cogan; Mr. and Mrs. H. Concannon, Miss Blake and Miss Lynch, Lieutenant-General St. J. Clerke and Mrs. and the Misses Clerke; Mr. J., Mrs., and Miss Casson; Mr. James, Mrs., and Miss Campbell; Alderman and Miss Carroll, Mr., Mrs., and Miss Crean; Lieutenant F. Campbell, A.D.C.; Mr. and Mrs. H. Campbell, Mr., Mrs., and Miss Cornwall; Lieutenant-Colonel and Mrs. Calthorpe, Mr., Mrs., and Miss Creagh; Mr. and Mrs. T. R. Crawford and Miss Brien; Mr., Mrs., and Miss Clarke; Mr. and Mrs. Clirehugh, Mr. and Mrs. Creaser, Mr. and Mrs. Croker, Mr. and Mrs. Cliffe, Mr. Culverwell, Mr. T. Carroll, J.P.; Mr. R. Carroll, Mr. Thomas Crozier, Mr. F. Crozier, Mr. J. Carroll, Mr. Chandler, Mr. R. Chandler, Dr. Cahill, Mayor of Cork, Edward Casey, T.C.; Mr. and Mrs. Clare, Dr. Calanan, Mr. J. Connolly, T.C.; Mr. and Mrs. Chaytor, Miss Corlett, Mr. E. C. Carmichael, Mr. and Mrs. Crofton, Mr. E. Courtenay, Mr. Carleton and Mr. Minchin, Mr. J. and Mrs. Cosart, Mr. and Mrs. Condran, Mons. Corbiere, Mr. and Mrs. Cranfield, Mr. Carigan, Mr. Cole, 11th Hussars; Mr. W. Campbell, Mr. Copeland, Mr. George Coulter, Mr. and Mrs. M. D'Arcy, Mr. Morgan, Mrs. and Miss D'Arcy, Dr. and the Misses Duckett, Messrs. R. and J. Duckett, Alderman, Mrs., and Miss Durdin; Captain and Mrs. Davern, Baron and Mrs. Deasy, Dr., Mrs., and the Misses Duke; Lieutenant, Mrs. and Miss Dunlevie, Mr. R. and Mrs. Downe and Miss Fitzgerald; Colonel, Mrs., and Miss Durnford; Mr. and Mrs. M. Dwyer, the Mayor of Drogheda, Mr. and Mrs. Dames, Mr. and Mrs. Dolan, Mr. Devitt, T.C.; Mrs. and Miss Croft, Mr. P. Dubadat, Mrs. and the Misses Dannacott, Mr. and the Misses Dickins, Mr. and Mrs. Dix, Mr. Daly, J.P., and Mrs. Daly; Mr. and Miss Daly, Mr. and the Misses Deyrolles and Miss Richards, Captain Dairs, Mr. George and Mrs. Dixon, Miss Douglas, Mr. Dickson, Mr. and Mrs. J. J. Dugdale, Mr. J. Devereux, Mr. Dixon, Mr. P. J. Dowley, Captain and Mrs. Douglas, Mr. H. Dairs, Mr. A. Dillon, Mr. and Miss Daly, Mr. and Miss Dunn, Surgeon and Mrs. De Lisle, Mr. and Mrs. and Miss Delapoor, Captain and Mr. Donnelly, Mr. F. Darley, Mr. H. E. Doyle, Mons. Durassie, Mr. M. Egan, T.C.; Mrs., and Miss, and Mr. H. and the Misses Ellis; Colonel and Mrs. Edwards, Mr. and Mrs. R. Exham, Mr. Samuel Eakins, T.C., and Mrs. Eakins; Mr. W. Everard, Mr. and Mrs. J. Ennis, M.P.; Mr. S. N. Elrington, Mr. J. Edmonston, Mr. and Mrs. Elliott, Mr. and Mrs. Ellis, Mr. John Fry, Mr. Thomas Fry, and Miss Clarkson; Mr. J. Flood, Mr. H. Flood, Captain Freemantle, Mr. and Mrs. H. L. Fry, Lieutenant Fetherston, Mr. and Mrs. John French, Mr., Mrs., and the Misses Foot, Mr. G. W., Mrs., and Miss Fitzgerald; Messrs. Fitzgerald, Mr. and Mrs. D. Fitzgerald, Lieutenant Colonel Foster, A.D.C.; Mr. A. Ferrier and Miss Clarke, Mr. Ferguson, Q.C., and Mrs. Ferguson; Mr. and Mrs. W. Findlater, Miss Wolfe, Mr. W. J. and Mrs. Fitzpatrick, Rear-Admiral Frederick, Lieutenant and the Misses French, Mr. Fisher, Mr. Fayle, Miss Farrell, Mr. J. Franklin, Mr. P. Farrell, T.C.; Mr. J. G. Fennell, Colonel Frazer, 11th Hussars; Mr. B. L. and Mrs. Guinness, Mr. John and the Misses Gray, Mr. and Mrs. Gifford, Mr. G. Gifford, Mr. John Gregg, Mr. Gordon, Mr. and Mrs. J. B. Greene, Mr. and Mrs. Thomas Greene, Mr. Godkin, Mr. B. L. Guinness, jun., Mr. Edward Guinness, Mr., Mrs., and Miss Henry Garbois, Mrs. and Miss Greer, Miss Carson, Mr. J. and Miss Greer, Mr. E. Grubb, Mr. William Cahill, Mr. and Mrs. Graves, Mr., Mrs., and Miss Graydon; Rev. J. Galbraith, Colonel and Mrs. Goodwin, 41st Regt.; Mr. and Miss Guerin, Messrs. Gausson, Mr. John and Major S. Greene, Mr. S. B. George, Mr. Grome, Major and Mrs. Greene, Captain Grant, 11th Hussars; Miss Greaves, Mr. R. C. Grubb, Mr. Gaskin and Miss Chadwick, Captain Gavan, Mr. and Mrs. A. Hayes, Mr. J. and Miss Houghton, Dr. and Mrs. N. Handcock, Hon. Justice, Mrs., and the Misses Hayes; Dr. and Mrs. Hamilton, Mr. H. Hodgins, Mr. and Mrs. Haslett, Mr. G. Hoyte, J.P.; Mr. E. Hornsby, Alderman and Mrs. Hudson, Mr. and Mrs. T. Hone and the Misses Yepton, Mr. and Mrs. Hughes, Mr. and Mrs. Henry, Dr. and Mrs. Hughes, Mr. and Miss Hatchell, Mrs. J. Perrin, Judge and Mrs. Hargrave, Hon. R. Harbord, Dr. and Miss Hatchell, Dr. Hughes, Col. Hughes, Mr. W. and Mrs. Houghton, Mr. and Mrs. Harding, Mr. Hill, R.N.; Mr. H. Hayes, Sergt. and Mrs. Howley, Mr. and Mrs. Mansfield, Mrs. and the Misses Hudson, Mr. Hatchell, jun., Mr. Heron, Q.C.; Mr. Thomas, Mrs., and Miss Henry; Captain Humphrey, Mr., Mrs., and Miss Hamilton; Mr. and Miss Harris, Mr. and Mrs. J. Henry, Mr. and Mrs. Harrington, Mr., Mrs., and Miss Hillier; Mr. G. Humphreys, Alderman Hurte, Mr. G. A. Harvey, Rev. S. Haughton, Mr. Hebart, Colonel Henry, Dr. and Mrs. Hamilton, Captain Harvey and Miss Ferrott, Mr. and Mrs. Hutton, Captain Hampton, 5th Dragoon Guards; Lieutenant Herne, 60th Rifles; Captain Harnett and Mr. Cheape, 11th Hussars; Colonel, Mrs., and Miss Harris; Mr. and Mrs. Hadaway, Mr. and Mrs. Hutton, Captain Ingram, Mr. and Mrs. L. Joynt, Mr. and Mrs. P. D. Jeffers, Mr. Ireland, Mr. and Mrs. W. M. Jones, Mrs. A. Jellico, Mr. Jones and Mr. Burnet, Mr. A. Jones, Mr. and Mrs. Ingram, Mr. H. Irvine, Miss Jones, Mr. H. J. Johnstone, Mr. and Mrs. Samuel Ireland, Mr. and Mrs. H. Jones, Mr. A. G. Jones, Dr. Kirwan, Mr. and Mrs. E. H. Kinahan and Mr. Dickinson, Mr. and Mrs. Thomas Kift, the Misses Kilbee, Hon. Judge and Mrs. Kelly, Hon. Judge Keatinge, Mr. Mrs., and Miss Kirwan; Dr., Mrs., and Miss Kennedy; Mr. and Mrs. J. C. Kelly, Mr. and the Misses King, the Mayor of Kilkenny, Captain W. Kingston, 5th Dragoon Guards, Lieutenant Kane, Mr. Kelly, Dr. and Miss L'Estrange, Captain and Mrs. Litton, and Miss Stewart; Mr. A. C. LaNauze, Mr., Mrs., and Miss Lambert; Mr. Longfield, M.P.; Mr., Mrs., and the Misses Lentaigue; Captain Leslie, Mr., Mrs., and Miss Lowry; Mr. Charles and Miss Leslie, Mr., Mrs., and Miss LaTouche; Mr. James LaTouche, Major General and Mrs. Lloyd, Judge Longfield, Mr. and Mrs. William Lee, Mr. and the Misses LaTouche, Mr., Lady Mary, and Miss Lindsay; Mr. Lefroy, Mr. L. Lefroy, Colonel and Mrs. Lake, Mrs. J. L. Litton, Major Lee, Mayor of Liverpool, Mr. and Mrs. Lalor, Mrs. Lackie, Dr. and Mrs. R. Labatt, Mr., Mrs., and Miss Loyd; Mr. and Miss S. Lemon and Mr. James, Mr. Lockrane, Dr. T. Laurence, Mr. and Mrs. A. Lambert, Mr. William Lewis, Mr. Robert Landells, Captain Lyon, Royal Artillery; Miss Lowe, Mr. and Mrs. Lovell, Mons. Lescur, Mr. and Mrs. McGrath, Dr. J. Makesy, Mr. and Mrs. Morrow, Mr., Mrs., and Miss McGee; Mr. J., Mrs., and Miss Manly; Mr. J. R. Malone, Mr. Malone, jun.; Mr. T. C. Meredith, Mr., Mrs., and Miss Murphy; Mr. McCarthy, Mr. and Mrs. Mathews, Mr. W. J. Maher, Mr. Mitchell, Mr. and Mrs. Middleton, Mr. W. A. Mustyn, Mr. and Mrs. Morney, Colonel M'Causland, R.E.; Mr. and Mrs.

Mills, Mr. and Mrs. R. Morris, Mr. and Miss M'Auley, Mr. and Mrs. Mulvany, Mr. and Miss E. Maunsell, Mr. T. Malone, Mr. Molloy, Mr. G. Murphy, Mr. E. B. Murphy, Mr. G. Malcomson, Mr. and the Misses McCullagh, Captain Milligan, 60th Rifles; Lieutenant Mortimer, 60th Rifles; Mr. T. Mullins and Mr. J. Mullins, Miss Manly, Mr. and Mrs. Murphy, Mr. and Mrs. M'Comas, Mr. Meagher, T.C., and Mrs. Meagher; Mr. F. Morgan, Mr. Maclean, Mr. C. Macnamara, Mr. E. Morgan, Mr. Meyly, Alderman and the Misses Moylan, Mr. D. and Mrs. Marquis, Mr. and Mrs. J. Martin, Mr. R. and Mrs. Molloy, Miss Duffy, Mr. F. Macdonogh, M.P., and the Misses Macdonogh; Dr. and Miss Mapother, Mr., Mrs., and the Misses Maunsell, Mrs. and Miss M'Dermott, Mr. and Mrs. F. Mullins, Mr. M'Farlane, Alderman and Mrs. Mackey, Mr. M'Grath, T.C.; Chief Justice and the Misses Monahan, Lieutenant Colonel Masters, Mr. and Mrs. H. Manders, Mr. H. Mrs., and the Misses Mills; Mr. and Mrs. G. W. Maunsell, Mr. T. Mostyn, Mr. A. M'Mahon, Mr. Murphy, T.C., and Miss Murphy, The Mayor of Manchester and Mrs. Bennett, Mr. and Mrs. Mathie, Mr. C. and Miss Mullins, Mr. Murphy, Mr. Murdock, Dr., Mrs., and Miss Nugent; Mr., Mrs., and Miss V. Nugent; Mr. Norwood, T.C., and Mrs. Norwood; Mr., Mrs., and the Misses Neville; Mr. W. J. Naper, Mrs. and the Misses Nugent, Lady and Miss Nugent, Mr., Mrs., and Miss Norman; Mr., Mrs., and Miss Newton; Miss Nixon, Dr. and Mrs. Owens, Mr. O'Reilly, T.C.; Hon. Justice O'Brien, Mrs. and Miss O'Brien, Mr. and Miss O'Farrell, Judge O'Hagan and Miss O'Hagan, Captain O'Connell, A.D.C.; Mr. O'Farrell, D.L., and the Misses O'Farrell; Mr. and Mrs. Daniel O'Brien, Dr. and Miss O'Rourke, Mr. C. Orpen, Madame and Miss O'Grady, J. C. Owens, Surgeon 5th Dragoon Guards; Dr. O'Hanlon, Mr. M. J. O'Grady, Mr. H. Owen, Mr. O'Donel, Miss Ormsby, Mr. O'Grady, Mr., Mrs., and Miss O'Connor, Mr. A. Parker, J.P.; Mrs. and the Misses Parker, Mr., Mrs., and the Misses G. Pilkington; Dr. and Mrs. Porter, and Miss Bond; Hon. Thomas Preston, Dr., Mrs., and Miss Plant; Mr. and Mrs. G. Pim, Mr. Richard and Mrs. Perrin, Captain, Mrs. Pim, and Miss Middleton; Colonel Pepper, Chief Baron, Mrs. and Miss Pigott; Mr., Mrs., and the Misses Parsons; President College of Surgeons, Mr. and Mrs. C. Pales, Q.C.; Mr. and Mrs. H. Parkinson, Mr. F. and Miss Penrose, Mr. D. Plunkett, Mr. and Mrs. G. V. Patton, Miss Parsons, Mr. and Mrs. Peacock, Mr. R. Pim, Mr. and Mrs. Perry, Mr. Posnett, Mr. Joshua Pim, Mr. and Mrs. Peate, Captain and Mrs. Plummer, Mr. A. and Mrs. Pile, Mr. J. J. and Miss Pim, Mr. and Mrs. H. Parker, Mr. E. Peile, Mr. J. Pim, Mr. and Mrs. Phoenix, Mr. W. G. Plunkett, Mr. A. Plunkett, Mr. George Phoenix, Mr., Mrs., and Miss Peacock, Dr. and the Misses Quinlan, Mr. John Quinlan, Commander and Mrs. Robinson, Mr. and Mrs. Robinson, Dr. and Mrs. Ringland, Major-General, Mrs., and Miss Ridley; Mr. and Mrs. Redmond, T.C.; Mr. and Mrs. Robert Reeves, Mr. J., Hon. Mrs., and Miss Reilly; Alderman Reynolds, Mr. and Mrs. J. F. Russell, Alderman L. and Miss Reynolds, Mr. Rochford, T.C.; Mr. and Mrs. J. C. Reynolds, Mr. Thomas Reynolds, Mr., Mrs., and the Misses Riall; Lady and Captain Robertson, Lady and the Misses Redington, Doctor Joseph Ryan, Mr., Mrs., and the Misses Ryland; Miss Ross, Messrs. W. and J. Rigby, Mr. N. Robinson, Mr. J. G. Rathbone, Captain S. Richardson, 78th Highlanders; Captain Roberts, Mr. and Miss Radcliffe, Mr. and Mrs. Raymond, Mr., Mrs., and Miss Switzer; Mr. and Mrs. A. M. Sullivan, Dr. and Mrs. Sawyer, Major, Mrs., and the Misses B. Smith; Mr. Sidney, Q.C., and Mrs. Sidney; Mr., Mrs., and Miss O. Speer; Mr. Speer, jun.; Mr. H. Shingleton, Mr. F. and Mrs. Scovell, Colonel and Mrs. Smith, Captain R. B. Smith, Mr. J. Sweetman, T.C.; Major-General and Miss Stothard, Solicitor-General and Mrs. Sullivan, Mr. W. H. and Mrs. Shegog, Mr. A. and Mrs. Stephens, the Mayor of Salford, Mr. Smyth, Mr. and Mrs. A. Shingleton, Mr. and Mrs. Stephens, Mr. and Mrs. H. Sandys, J.P.; Miss Shaw and Miss Reid, Mr. W. and the Misses Smith, the Misses Sparrow, Mr. and Mrs. R. Smith, Mr. J. Spearing, Mr. St. John Corbett, Mr. and Mrs. Shields, Mr. and Mrs. P. L. Simmonds, Mr. Senger, Mr. and Mrs. Sarsfield, Mr. and Mrs. Somett, Mr. and Miss Short, Mr. R. D. Scott, Mayor of Sunderland, Colonel and Mrs. Shute, Dragoon Guards; Mr. Stokes, Mr. B. Stoney, Mr. and Miss Singer, 28th Regt.; Mr. Sheppard, Mr. Sutherland, Mr. R. Staples, Mrs. and Miss Staunton, Mr. R. and Mrs. Smith, Captain Shulldham, Miss Saunders and Miss Elliott, Miss Strangeman, Mr. and Mrs. O'Sullivan, and Miss Bond, Captain and Mrs. Saunderson, R. Artillery; Mr. and Mrs. Shaw, Surgeon and Mrs. Stewart, 78th Regt.; Miss Sergeant, Mr., Mrs., and Miss J. Tufnell; Mr. and Mrs. B. Tabuteau, Alderman and Mrs. Tarpy, Mr., Mrs., and Miss Thunder, Mr., Mrs., and the Misses Trevor; Mr., Mrs., and Miss Tyne; Mr. and Mrs. J. Turbott, Mr. and Mrs. Taggart, Mr. Turnley, Miss Trench, Mr. and Mrs. C. Trench, Mr., Mrs., and the Misses Turbott; Mr. and Mrs. Travers, Mr. and Misses M. Taylor, Mr. John Talbot, Mr. Trench, Mr. Townley, Mr. and Miss Taylor, Messrs. — and H. Todhunter, Messrs. R. and Mr. Tabuteau, Hon. Mr., Mrs., and Miss Trench; Mr. Arthur Charles Croker (late 77th Regt.) and Mrs. Arthur Charles Croker; Mr. and Mrs. John Vance, Mr. John Vernon, Mr., Mrs., and Miss Vance; Hon. Mr. and Mrs. Vereker, Hon. Mr. Smyth Vereker, Captain Vaughan, Mons. Vanderbroek, Mr. and Mrs. W. Wight, Dr. Wharton, Mr. J. E. Walshe, Q.C., and Mrs. and Miss Walshe; Captain and Mrs. Wilcox, Right Hon. J. and Mrs. and Miss Whiteside, Captain Willis, A.D.C.; Mr. J. L. Wharton, T.C., and the Misses Wharton; Mr. E. R. Wodehouse, Private Secretary to the Lord Lieutenant; Lieutenant A. D. Wodehouse, A.D.C.; Mr., Mrs., and the Misses Hans H. Woods; Mr. F. A. Willis, Mr. P. Wright, Mr. F., Mrs., and Miss Wilme and Mr. Mathers; Hon. Mrs. White, Mr. and the Misses Wilson, Baron Woulfe, Mr., Mrs., and Miss Wilkinson; Mr. B. Whitestone, Mr. and Miss Walpole, Mr. S. Watson, Mr. and Mrs. Wigham, Mr. Whitfield, Mr. J. B. Gallagher and Mrs. Gallagher, Mr. Watkins, Mr. and Miss Webb, Mr. and Mrs. Watson, Mr. and Mrs. Whitty, Mr. J. and Miss Williams, Mr. and Mrs. Wheeler, Mr. John Whelan, Mr. Willa, Mr. and Mrs. Finnimore, Mr. Wickman, Mr. and Miss Wilkinson, Major Wallace, Mr. R. Warren, Lieutenant-Colonel Williams, 60th Rifles; Lieutenant Wallace, 60th Rifles; Mr. and Miss Wyley, Miss Williams, Mr. T. A. Wright, Dr. F. Watson, Mr. E. Whitfield, Captain and Mrs. Montgomery, Mr. and Mrs. Morrogh, Mrs. and Miss Murphy, Mr. Cambridge Grubb, Mr. E. Taylor, Mr. and Miss Howe, Right Hon. A. Brewster and Mrs. French, Lady F., Mr., and the Misses Cole; Lady, Mr., and Miss Chapman; Honourable Judge Berwick, the Rev. Sir William Cope and the Misses Hauteville; Hon. Robert Butler, Sir Drury and Lady Dickinson; Lord Provost of Edinburgh; Sir Richard Griffith, Bart.; Hon. Mr., Mrs., and Miss French; Hon. Mr., Mrs., and Miss Harman; the Recorder, Mr. A. H. and Mrs. Bagot, the High Sheriff, Master G. and Mrs. Burke, Dr., Mrs., and the Misses Beatty; Mr. J. C. Beatty, Mr. Arthur Barrington, Mr. and Mrs. J. K. Boswell, Mr. and Miss A. Busby, and Miss Pillars, Captain Brabazon, Mr. Henry, Mrs., and Miss Bastable; Colonel Whitmore, Major Ellis, A.D.C.; Mr. Edward J. Barton, Mr. and the Misses J. K. Butler, Mr. and Mrs. J. G. Boileau, Mr., Mrs., and Miss Croker Barrington; Lieutenant J. R. and Mrs. Bell, R.N.; Mr. and Mrs. Edward Blackburne, Mr. A. Boyle, Mr. R. W. Boyle, Mr. H. M. Barton, Colonel Buchanan, Mr. and Mrs. M. J. Brady, Lieutenant and Mr. Boulton, R.N.; Mr., Mrs., and Miss St. John Butler; Mrs. James Butler, Captain Beamish, Mr., Mrs., and Miss Loftus Bland; Mr., Mrs., and the Misses James Barrett; Mr. Thomas Arkins, Mr. Hastings and Miss Brooke, Mr. Joseph Butler, T.C.; Mr. Butler, jun.; Master and Mrs. Brooke, Colonel Adams, 49th Regt.; Captain Huyshe, do.; Lieutenant Nason, do.; Lieutenant Thomas, do.; Lieutenant Arbuthnot, do.; Lieutenant West, do.; Judge and Mrs. Battersby, Mr. and Mrs. A. Bewley, Mr. and Mrs. M. Brookes, Dr. Burke, Mr. and Mrs. K. Clay, Mr. L.

Crothwaite, Mr., Mrs., and Miss Corbett; Mr. Dwyer, Mr. H. Devitt, Major M'Donnell, 14th Regt.; Dr. MacDonnell, R.N.; Mr. and Miss Dunne, Mr. and Mrs., and the Misses Drury; Mr. and Mrs. Geale and Mrs. Jones; Mr. Davenport, Mr. and Mrs. Dunne, Mr. and Miss Ellis, Mr. Fishbourne, Mr. Farrell, Mr., Mrs., and Miss Graham; Mr., Mrs., and Miss Gavagan; Mr., Mrs., and Miss Gerrard; Mr. and Mrs. W. J. Hancock, Mr. and Mrs. Lucius Hutton, Dr. and Mrs. Hamilton, Mr. and Mrs. Robert Heron, Mr. and Mrs. Harold, Mr. W. and Miss Hone, Mr., Mrs., and Misses Johnston; Mr. Keatinge, Mr. and Mrs. Lestrangle, Mr. R. M'Kay, Mr. and Mrs. T. Lewis, Mr. and Mrs. M'Kay, Alderman M'Mahon, Mr. Robert Mayne, Mrs. M'Kenzie and Miss M'Cauley, Dr. Moore, Mr. Woodward, Mr. Mills, Mr. Ormsby, Mr. R. Pim, Mr. A. Guinness, Mr. and Mrs. Pollock, Mr. Quin, Mr. Robinson, Mr. and Mrs. Harte and Mrs. Skeffington, Mr. Charles and Miss Stanford, Mayor of Sligo, Colonel, Mrs., and Miss Stewart, Mr. Tyner, Mr. and Mrs. Taaffe, Captain Tempest, Dr. Wall, Mr. Richard Wall, Dr., Mrs., and Miss Mullen; Mr., Mrs., and the Misses Wodehouse; Lieutenant and Miss Flood, Messrs. R. and T. Walsh, Mr. Murdock, Mr., Mrs., and Miss Clarke, General Sir James Jackson, Mr. and Mrs. Charles O'Brien, Mr. and Mrs. W. Sullivan and the Misses Kilbee, Mr. and Miss Clarke.

The subjoined is the address from the Royal Dublin Society to His Royal Highness the Prince of Wales:—

"MAY IT PLEASE YOUR ROYAL HIGHNESS—We, the President, Vice-Presidents, and Members of the Royal Dublin Society, desire to offer to your Royal Highness our sincere and warm congratulations upon your arrival in this city for the purpose of inaugurating, in the name of Her Most Gracious Majesty, the Dublin International Exhibition, a section of which, that devoted to the display of agricultural machines and implements, will occupy a large portion of the Society's premises. The Royal Dublin Society, which has been in existence for upwards of a century and a quarter, was incorporated by your Royal Highness's ancestor, King George the Second, for the promotion of such of the useful arts and sciences as would tend not only to develop the resources of this country, but to stimulate the intelligence and industry of its people. As means for the attainment of these ends, it possesses extensive museums of natural history and of agriculture, a well filled library, a fully equipped chemical laboratory, a botanic garden, and schools of art—departments which are presided over by a staff of officers whose energies are earnestly directed towards the promotion of the objects of the institution. Your Royal Highness is already aware that in addition to its annual agricultural shows this society has held periodical exhibitions of art and manufactures, one of which, inaugurated in the year 1861, was honoured not only by the presence of your Royal Highness, but by that of your revered and deeply lamented father—the late Prince Consort. It is, therefore, a source of peculiar gratification to the society, which was the first to originate, thirty-six years ago, in the United Kingdom, Exhibitions similar to that now about to be opened, to feel assured that they have been stamped with such distinguished approval. The Royal Dublin Society, which enjoys the high honour of being under the patronage of our Most Gracious Sovereign, and has been encouraged by the countenance extended to it by your Royal Highness as Vice-Patron, desires to convey the assurance that the society will endeavour to discharge the important duties entrusted to it in the manner best calculated to advance the interests of the country and to secure the approval of your Royal Highness. In conclusion, we desire to express our loyal attachment to our beloved Queen, and our earnest prayer that your Royal Highness and your illustrious consort may long enjoy the possession of every domestic blessing, under a Sovereign whose benign sway extends not only over a mighty empire, but reigns in the heart of a loyal and attached people.

"9th May, 1865."

(Signed),

"WODEHOUSE, President.

To which the following reply was made by the Prince:—

"Viceregal Lodge, May, 11, 1865.

"Lieutenant-General Knollys is desired by the Prince of Wales to acknowledge the receipt of the address of the President, Vice-Presidents, and members of the Royal Dublin Society. His Royal Highness desires to return them his warm thanks for their congratulations on his arrival. It has been a source of satisfaction to him to revisit the city which has given its name to a society to whose members the International Exhibitions of Ireland owe so much, and the associations connected with his visit to the Exhibition in 1861, with his revered and lamented father, have heightened this feeling in his Royal Highness's mind. His Royal Highness has directed General Knollys to add how much he appreciates the sentiments of loyalty towards her Majesty the Queen, and the kind wishes for the welfare of the Princess of Wales and himself, which are contained in this address.

"To the President, Vice-Presidents, and members of the Royal Dublin Society."

#### PRIVATE VISIT OF THE PRINCE OF WALES TO THE EXHIBITION.

On Thursday, the 11th May, H.R.H. the Prince of Wales paid a private visit to the Exhibition. The intention of His Royal Highness to visit the building was not generally known; yet the attendance was exceedingly large and fashionable. At a quarter before twelve o'clock the Prince of Wales left the Viceregal Lodge, accompanied by the Lord Lieutenant and Lady Wodehouse, in a carriage with four outriders. In the same carriage with his Royal Highness were the Lord Lieutenant, Lord Dufferin, and Mr. Arkwright, A.D.C. In the next were Earl Spencer, Lady Wodehouse, General Knollys, and Mr. Herbert Fisher, Private Secretary to the Prince of Wales. Colonel Forster, Mr. Wodehouse, Private Secretary to the Lord Lieutenant, and the Hon. John Wodehouse, occupied the third carriage. The escort consisted of a troop of the 10th Hussars. At the Exhibition his Royal Highness was received by the principal members of the Exhibition Committee.

Crosthwaite,  
MacDonnell,  
Jones; Mr.  
Miss Graham  
and Mrs. Lu  
Miss Hone,  
Mrs. T. Le  
M'Cauley, I  
Pollock, Mr.  
Mayor of Sl  
Mr. Richard  
Messrs. R. a  
Charles O'Br

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PRINCE OF WALES MAKING PURCHASES, MAY 12, 1865

When his Royal Highness alighted from his carriage, the Duke of Leinster; Mr. Gilbert Sanders, Chairman of the Executive Committee; Mr. Charles E. Bagot; Mr. H. Parkinson; and Mr. S. Alfred Jones, architect of the building; conducted the distinguished visitor into the Exhibition, followed by the noblemen and gentlemen already mentioned, who walked in procession. His Royal Highness passed through the sculpture gallery, staying especially to admire the statue of Judith, by Mr. Storey. Having examined the statues, the Prince entered the apse, which forms the greater part of the French court, and examined the Gobelin tapestry exhibited by the Emperor of the French, and the beautiful collection of bronzes which are ranged under the gallery. The Prince stayed at the stands of the chief manufacturers of china and ceramic ware. The case of the Messrs. Copeland was specially admired. In the nave, the Prince stopped before the case of poplins of the Messrs. Fry. He appeared to be greatly struck with the monogram of the Princess, brocaded on a blue ground. He also recognised in their case the peculiar colour of the poplin made by them for her Royal Highness, on the occasion of her entry into London. Passing from this stand, his Royal Highness stopped before the jewellery case of Mr. Schriber, and entered into conversation with the exhibitor, to whom he expressed the warmest approval of the beautiful articles which he had contributed. In that portion of the building where the Armstrong and Whitworth guns are exhibited, his Royal Highness was met by Colonel Durnford, R.A., who entered into a detailed explanation of these extraordinary implements of war. In the Carriage Court his Royal Highness, amongst other objects to which his attention was directed, examined a very handsome Irish jaunting car, exhibited by Mr. J. Browne, of Great Brunswick-street, and which, curious to say, was the only specimen of this national vehicle in the Exhibition. Mr. Browne gained the prize medal at the London Exhibition of 1851. On his return the Prince inspected Mr. Brunker's stand, Minton's china, and the cases of Allen and Forrest. By his directions some beautiful specimens of Irish manufacture in lace were sent out to the Viceregal Lodge by Mrs. Allen. We give an illustration of the scene showing Messrs. Fry's case.

His Highness spent two hours in minutely inspecting the objects of interest in the building, and in making purchases. Of the representative class of exhibitors, none can be named taking a higher place than Messrs. Fry and Co., of Dublin; and by purchases made from their show of poplins for the Princess of Wales, the Prince will have, no doubt, stimulated the energy and assisted the fortunes of a branch of manufacture in which Ireland stands almost alone. So beautiful a fabric is in no danger of going wholly out of fashion, it is true; but, on the other hand, it is a good thing to induce a still more general practice of dressing in a material that is of British production, and that is unsurpassed by the silken draperies of other countries. The pattern which most attracted the notice of the Prince of Wales was naturally one that was ingeniously composed of the Princess's monogram. The device, in gold, on a blue ground, had a very good effect, even regarded in a purely ornamental light. The Prince ordered this poplin at once; and he commanded that a number of very elegant specimens—some with a golden fern embroidered on a *rose du Barri* ground, some with snow crystals, some with lilies of the valley, showing prettily upon black; and some of a design more suitable to morning wear in the favourite brown, in deep but brilliant blue, and other colours—should be sent to the Viceregal Lodge for inspection.

Ascending the north-eastern gallery, the distinguished party passed into the chamber occupied by the productions of the Old Masters. His Royal Highness, to whom the most remarkable works in the collection were pointed out by Mr. Doyle, especially admired the two fine examples by Hogarth, lent by the Earl of Charlemont. An exquisite painting, by Vandyke, entitled "The Monk" was also noticed. In the British gallery, which was next visited, Mr. Frost's picture of "Chastity," Phillips' representation of "Muleteers," and Stanfield's fine marine piece attracted attention. His Royal Highness then passed through the mediæval court, and entered the Belgian gallery, in which he purchased a fine picture. Sir Jocelyn Coghill and Mr. Close attended in the photographic gallery, and pointed out the principal features of that collection. Passing through the first-class refreshment saloon the Prince entered the Belgian court, where he was waited upon by M. Corr Vander Maeren, the Belgian Commissioner. From this he proceeded to the Austrian and Zollverein courts, and thence to the Italian, where Signor Marani, Italian Consul, was introduced, and the contents of the court were explained. Again ascending to the galleries, the Prince examined the Indian and Colonial collections. The Canadian department excited great interest; here he was attended by Captain Cuff and the Rev. Dr. Adamson. By Mr. P. L. Simmonds the more noticeable articles in the Colonial collections were carefully explained. Dr. Honeyman acted as guide in the space allotted to Nova Scotia, and Dr. Forbes Watson described the Indian court. It having been intimated to the Prince that the London Stereoscopic Company, "Official Photographers to the Exhibition," were anxious to obtain one or two views, his Royal Highness at once graciously expressed his willingness to comply with the request, and two most interesting pictures were taken of the Prince of Wales and several members of the committee and principal officials, grouped upon the steps outside the

apse leading down to the ornamental pleasure grounds. Mr. Nottage, the secretary of the company, and Mr. Yorke, the principal operator, were most successful in their arrangements. Having made the tour of the galleries, the Prince of Wales again passed through the sculpture hall, and left the building at half-past two o'clock, loudly cheered by the immense crowd which had assembled outside.

#### BALL OF THE IRISH ACADEMY OF MUSIC AT THE EXHIBITION.

The committee of this institution, which for the last twelve years has gradually progressed in usefulness and popularity, gave a grand ball on Friday evening, the 12th of May, under the patronage of Her Excellency Lady Wodehouse, and the following Lady Patronesses:—

MARCHIONESS OF DOWNSHIRE  
MARCHIONESS OF DROGHEDA  
MARCHIONESS OF ELY  
LADY RACHEL BUTLER  
MARCHIONESS OF KILDARE  
COUNTESS OF GRANARD  
COUNTESS OF MILTOWN  
COUNTESS OF CHARLEMONT  
COUNTESS OF HOWTH  
COUNTESS OF DONOUGHMORE  
LOUISA COUNTESS OF SEAFIELD  
LADY EMILY PEEL  
VISCOUNTESS GORMANSTON

VISCOUNTESS POWERSCOURT  
VISCOUNTESS AVONMORE  
LADY GRACE VANDELEUR  
LADY MARGARET STRONG  
LADY FANNY COLE  
LADY LURGAN  
LADY ANNALY  
THE HON. MRS. PRESTON  
THE HON. MRS. FITZGERALD  
THE HON. LADY GRANT  
THE HON. MRS. WHITE  
THE HON. MRS. GORDON  
THE HON. MRS. REILLY

THE HON. MRS. RIDLEY  
THE HON. MRS. KING HARMAN  
LADY STAPLES  
LADY BUTLER  
LADY COGHILL  
LADY M'MAHON  
LADY BROOKE  
LADY POWER (EDERMINE)  
LADY BURKE  
MRS. BRADY  
MRS. CUSACK SMITH  
MRS. VANCE  
MRS. KEY

It was at one time thought that H. R. H. the Prince of Wales would have prolonged his stay in the city until after the ball; but he did not remain, and the chief place, therefore, devolved upon Lord Wodehouse. The company present amounted almost to 2,000, including the following of the nobility:—Their Excellencies the Lord and Lady Lieutenant, his Grace the Duke of Leinster, the Right Hon. the Lord Mayor, the Earl and Countess of Charlemont, the Earl and Countess of Howth, the Marquis and Marchioness of Drogheda, the Marchioness of Ely, Viscount and Viscountess Powerscourt, the Countess of Seafield, and Lord Henry Loftus.

The prices of tickets were, to Exhibition Season Ticket holders—gentleman, 15s.; lady, 10s. To non-season Ticket holders—gentleman, £1 10s.; lady, £1. The ball was numerously attended, and proved a very great success. The orchestra consisted of the celebrated band of the 78th Highlanders, under Mr. Smalley; and a string band, of forty performers, led by Mr. Harry Hardy, the talented bandmaster of the Constabulary band. The spacious nave, on this occasion, presented a most beautiful appearance. The long rows of gasaliers sparkled against the crystal roof, and threw down a perfect glare of brilliancy on the equally brilliant dresses of the ladies and officers who strolled up and down. The Academy had every reason to congratulate themselves on the success of this their first ball, the receipts on sale of tickets being £452. Dancing was maintained in the concert room and nave till early dawn.

When the building is illuminated by gas it is obvious that the whole structure is seen to much better advantage than by day. Beautiful as it was when the sunbeams passed through the transparent walls of the transept and lit up the remote courts, it was a far more imposing spectacle when the gas brought out all the objects that crowd it into bold relief, creating fine effects of light and shade in the recesses, and rendering its glittering sides almost opaque. It would be quite impossible to convey in a picture any notion of the aspect of the enchantment which it wears under the mystic influence of gaslight. The designs of the illumination were supplied by Mr. Gilbert Sanders; and the work of laying down the pipes and preparing the lights entrusted to several eminent Dublin firms, by whom it was performed with admirable skill and effect. Messrs. Edmundson, of Capel-street, had the charge of the lower part of the building. Mr. Gregg, of Sackville-street, lit the galleries. The seventy splendid standards in the transepts were erected by Messrs. Curtis, of Chancery-lane; and Mr. Daniel, of Mary-street, supplied the lights for the grand entrance-hall, the principal depository of treasures of modern art, both in paintings and statuary. Anything more exquisite than the effect produced in the grand hall can scarcely be conceived. Long lines of gas jets, carried over the ceiling, afforded the finest contrasts of light and shade. The collection of statuary in the lower part of the hall—the finest without exception which has ever been displayed at an Exhibition in the United Kingdom—was shown in the most beautiful relief. The splendid paintings which occupy the upper part were seen to better advantage in this mellow radiance than by the colder illumination of day. The larger concert hall was lit by a series of brilliant sunlights, which, in their arrangement as regards the general effect, were not equalled in any building, and which, without any disagreeable glare, served to show the noble proportions of the room, and the splendid cartoons by which it was decorated. Altogether there were upwards of 13,000 jets in the building, and the gas was supplied by the Hibernian and Alliance Companies, with four meters of 600 lights each.

It is impossible to withhold from Messrs. Edmundson, Gregg, and Daniel, the highest praise for the manner in which their duties were performed, or to restrain the expectations of success which the admirable arrangements of Mr. Sanders naturally excited.

## LOCAL COMMITTEES OF ADVICE.

In the capital of Scotland, and in many of the cities and towns of the United Kingdom, Committees of Advice were formed to further the objects and extend the interests of the Exhibition; and the Executive Committee derived most valuable assistance in many of the British departments of the Exhibition from their labours. The following is an alphabetical list of the Local Committees:—

**ABERDEEN.**  
Messrs. D. Wylie and Sons, 111,  
Union street

**BELFAST COMMITTEE.**  
The Mayor of Belfast, John B.  
Lytle, Esq.  
John Charley, Esq.  
William Ewart, jun., Esq.  
William Girdwood, Esq.  
M. Jaffé, Esq.  
E. H. Harland, Esq.  
John Hind, Esq.  
William Jury, jun., Esq.  
Hugh McClelland, Esq.  
James Kennedy, Esq.  
J. W. McMaster, Esq.  
Robert L. Patterson, Esq.  
John Rowan, Esq.  
Thomas Sinclair, Esq.  
E. Spotten, Esq.  
Elias H. Thompson, Esq.  
J. J. Weinberg, Esq.  
W. B. CAUGHEY, jun., Esq.  
*Hon. Sec.*

**BLACKBURN COMMITTEE.**  
Joseph Harrison, Esq., Chairman  
John Baynes, Esq.  
Eccles Shorrocks, Esq.  
Nathaniel Walsh, Esq.  
Lieutenant-Colonel Lund  
David Nicol, Esq.  
James Dickenson, Esq.  
Abraham Haworth, Esq.  
James Cunningham, Esq.  
John Sparrow, Esq.  
William Stone, Esq. (Mayor)  
W. D. Coddington, Esq.  
John Fish, Esq.  
George Walmsley, Esq.  
Robert Watson, Esq.  
Thomas Lewis, Esq.  
Messrs. AINSWORTH and SONS,  
*Secretaries, Exchange-street.*

**CORK COMMITTEE.**  
The Mayor  
Henry L. Young, Esq., Alderman  
Thomas Jameson, Esq., Alderman  
George Penrose, Esq., Alderman  
William Hegarty, Esq., Alderman  
Sir John Arnott, Alderman  
Edward S. Casey, Esq., T.C.  
JOHN FRANKLIN, Esq., Town  
Clerk, *Hon. Sec.*

**CHESTER COMMITTEE.**  
FOR NORTH WALES AND CHESHIRE.  
The Mayor of Chester, Chairman  
Alderman John Trevor, J.P.  
Thomas Bowers, Esq., T.C.  
William Farish, Esq., T.C.

John Morris, Esq., T.C.  
Thomas Truss, Esq., T.C.  
Edward Claudius Walker, Esq., J.P.  
and T.C.  
Francis Arthur Dickson, Esq., T.C.  
Rev. Arthur Rigg  
James Rigg, Esq.  
Henry Wood, Esq.  
Albert Wood, Esq.  
W. L. Ryland, Esq.  
E. W. Fernie, Esq.  
Bryan Johnson, Esq.  
Henry Bowers, Esq.  
William Brown, Esq.  
William Collinson, Esq.  
James B. Mowle, Esq.  
Richard Bolland, Esq.  
Joseph Beckett, Esq.  
Wm. Maysmor Williams, Esq., T.C.,  
Deputy Chairman  
— Hancock, Esq.  
Thomas R. P. Royle, Esq.  
Edward Parry, Esq.  
J. C. Edwards, Esq.  
— Davidson, Esq.  
Messrs. Palmi and Gamon  
— Ashton, Esq.  
George Chivas, Esq.  
James Dickson, Esq.  
Frederick John Hill, Esq.  
John Dodd, Esq., T.C.  
George F. Wynne, Esq.  
T. Bostock, Esq.  
Alfred O. Walker, Esq.  
James Gerrard, Esq.  
JOHN WALKER, Town Clerk, *Sec.*

**DUNDEE**  
The CHAMBER OF COMMERCE  
ROBERT STURROCK, Esq., *Sec.*

**EDINBURGH COMMITTEE,**  
CITY CHAMBERS, HIGH-STREET.  
The Right. Hon. the Lord Provost  
The Provost of Leith  
Bailie Cassells  
Bailie Alexander  
Bailie Hill  
Bailie Handyside  
Bailie Falshaw  
Bailie Miller  
Treasurer Callender  
Bailie Watt  
Bailie Steedman  
Bailie Macinlay  
Bailie Dishington  
George Lorimer, Esq.  
The Master of the Merchant Com-  
pany  
The Chairman of the Chamber of  
Commerce  
The Dean of the Faculty of Advo-  
cates

The Deputy Keeper of the Signet  
The President of the Society of  
S. S. C.  
The President of the Society of  
Chartered Accountants  
The President of the Royal Scottish  
Academy  
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### NUMBER OF BRITISH EXHIBITORS IN 1853 AND 1865.

The following is a comparative return of the exhibitors in the several classes at the two great Irish Exhibitions :—

CLASSES AND SECTIONS	1853. No. of Exhibitors	1865. No. of Exhibitors
<b>CLASS A—RAW MATERIALS.</b>		
1. Mining, quarrying, metallurgical operations, and mineral products, . . . . .	65	17
2. Chemical and pharmaceutical processes and products generally, . . . . .	26	41
3. Substances used as food, . . . . .	36	32
4. Vegetable and animal substances chiefly used in manufactures as Implements or for ornament, . . . . .	9	1
<b>CLASS B—MACHINERY.</b>		
5. A B and C—Machines for direct use, including carriages and railway and naval mechanism, . . . . .	84	137
6. Manufacturing Machines and tools, . . . . .	56	14
7. Civil engineering, architectural, and building contrivances, . . . . .	46	11
8. A and B—Naval architecture and military engineering, ordnance, armour, and accoutrements, . . . . .	51	29
9. Agricultural and horticultural machines and implements, . . . . .	73	80
10. A B C—Philosophical instruments and processes depending upon their use; photographic apparatus; musical, horological, and surgical instruments; machinery employed in spinning and weaving, and in the manufacture of wood and metal; machinery in general, . . . . .	26	59
<b>CLASS C—TEXTILE FABRICS.</b>		
11. Cotton, . . . . .	18	4
12. Woollen, and worsted, . . . . .	—	22
13. Silk and velvet, . . . . .	—	3
14. Manufactures from flax and hemp, . . . . .	49	6
15. Mixed fabrics, including shawls, but exclusive of worsted goods (Section 12), . . . . .	53	7
16. Leather, including saddlery and harness, skins, furs, feathers, and hair, . . . . .	24	19
17. Paper and stationery, printing and bookbinding, . . . . .	61	46
18. Woven, spun, felted, and laid fabrics, when shown as specimens of printing or dyeing, . . . . .	6	2
19. A and B—Tapestry, including carpets and floor cloths, laces, and embroidery, fancy and industrial works, . . . . .	157	32
20. Articles of clothing for immediate personal or domestic use, . . . . .	75	25
<b>CLASS D—METALLIC, VITREOUS, AND CERAMIC MANUFACTURES.</b>		
21. Cutlery and edge tools, . . . . .	22	12
22. Iron and general hardware, . . . . .	106	46
23. Working in precious metals, and in their imitation: jewellery, and all other articles of vertu and luxury not included in other classes, . . . . .	46	14
24. Glass, . . . . .	16	9
25. Ceramic manufacture, china, porcelain, earthenware, &c., . . . . .	22	15
25.* Antiquities—relics of ancient art in stone, woods, metals, and other substances, with rubbings, . . . . .	1	—
<b>CLASS E—MISCELLANEOUS MANUFACTURES.</b>		
26. Decoration, furniture, upholstery, including paper hangings, papier maché, and japanned goods, . . . . .	95	32
27. Manufactures in mineral substances used for building or decoration, as in marble, slate, porphyries, cements, artificial stones, &c., . . . . .	41	14
28. Manufactures from animal and vegetable substances, not woven or felted, or included in other sections, . . . . .	22	9
29. Miscellaneous manufactures and small wares, . . . . .	123	28
Poor law unions, gaols, fisheries, &c., . . . . .	58	9
<b>Total, . . . . .</b>	<b>1,467</b>	<b>775</b>

NOTE.—The above summary relates only to the British classification.

In 1853, woollen, worsted, silk, and mixed fabrics were grouped together.

Carriages were separated from machines for direct use, in 1853.

A—Machines for direct use, No. 56. B—Machinery in motion, No. 43. C—Carriages, No. 33. One of these carriages was French. Eleven of the machines for direct use in 1865 were Foreign exhibits.

# DESCRIPTIVE CATALOGUE.

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## SECTION I.—MINING, QUARRYING, METALLURGICAL OPERATIONS, AND MINERAL PRODUCTS.

*On Mining and Quarrying in Ireland, as sources of Industrial and Profitable Employment.*  
By E. H. WADGE, F.G.S.

IN Great Britain alone these pursuits yield a net produce of more than £60,000,000 annually, of which more than £4,000,000 goes into the revenues of the landed proprietors, without thought, trouble, or expense on their part, and is consequently to them as so much found wealth or treasure trove; the whole of the above enormous sum, being from *inert* matter, is absolutely an addition to the general wealth of the country, whilst the relative advantages as sources of employment are positively incalculable. The vast improvement in the localities amongst which mining industries are pursued far more than counterbalances the trifling loss of the surface land destroyed by these operations; besides which, mining leases usually contain clauses by which landowners are protected and paid the freehold value for such injured grounds. It should be remembered, also, that mines are generally found in wild, barren, mountainous districts, the reclamation of which would of itself be a positive national advantage. How full is Ireland of such situations and of such premises!

A writer in a popular Manchester publication recently made the following pertinent remarks:—"What to do for Ireland? has long been the question of questions to successive governments, and a difficulty to the most sagacious statesmen. What we should advise would be—cultivate and foster her mining industries; for she does indeed possess vast mineral riches, as witness her mines of sulphur, copper, and lead, in Wicklow and in Monaghan; her splendid mines at Berehaven; her mines comprising the property of the Mining Company of Ireland, and many other companies."

That Ireland abounds with minerals of the first order is a fact recognised, appreciated, and envied everywhere but in Ireland itself. The sales of her copper produce at Swansea bring fully twice the value of the average ores of Great Britain; the high prices commanded for her silver, lead, and blende ores are incontrovertible evidences of their superior richness. The granites of Ireland are unsurpassed for excellence, durability, or colour, for architectural or any other purposes to which granite is applied; they have in most instances the very great advantage of being more easily procured, and of cheaper transit, than almost any granite known in the markets of the Three Kingdoms: the buildings in and around Dublin are our witnesses as regards their beauty. Her marbles are matchless for variety, figure, and colour, take a magnificent polish, and are admirably adapted for interior decorative ornamentation.—See the great Hall in the new Museum Building, Trinity College, Dublin. Above all, water power for sawing the stone into form is to be found in close proximity to most of the quarries, by which facility the slabs or blocks may be sold at prices to defy competition, and insure extensive adaptation, provided they be introduced under judicious circumstances. Notwithstanding slates of excellent quality abound, few are wrought even for home consumption, and these so trivially as to be barely worth mentioning as of national consequence; whereas, if the quarries were prosecuted to their legitimate extent and real worth, large indeed would become the export trade; instead of, as at present, importing thousands on thousands of tons annually, and fulfilling the old apophthegm, "carrying coals to Newcastle," the order of things would be reversed.

Near Westport are extensive quarries, that have been wrought merely on the backs or surfaces of the veins; even from these good slates have been raised; whilst the deep stone,

always the best, has been but barely touched: capital was required for machinery and to lay out modern appliances. Now, here is a practical illustration of the necessity for opening up Ireland's traffic. The shipment of slates alone from Westport would constitute a trade of no mean or despicable character, and would render the lords of the soil millionaires. At the Browhead, near Crookhaven, flooring and paving flags of any size up to twelve feet by twelve feet (of any thickness), perfectly flat, of hard and durable texture, may be raised at a nominal cost; no over-burden to be removed, and the bottom of the broad Atlantic the site for the refuse or waste—a fact, the importance of which is known to but few except those engaged in slate quarrying, as surface damages for waste heaps are often enormous; a rail of two miles only will have to be constructed to convey the produce in unlimited quantities to one of the best shipping ports in Ireland.

At this place there are also capital roofing slates of fine colour, sound metal, and of large sizes; yet with all these advantages, these truly valuable quarries remain almost intact. Who will gainsay there is an opportunity for a prosperous business here? At other places in South Cork, excellent slates for general purposes can be raised and shipped at a comparatively nominal cost. Had such opportunities presented themselves in Wales, Westmoreland, or Cornwall, great and keen indeed would have been the competition of capitalists for their possession.

Recent inquiries and researches by experienced and properly qualified engineers and geologists confirm all that had been advanced by previous writers (generally supposed to be too sanguine in their views) of the favourable indications presented in various localities, which have lain neglected and dormant for many years—probably, and indeed in many cases certainly, from causes which have fortunately passed into oblivion, over which even our forefathers had no control; amongst them may be mentioned remote situations, and difficulty of approaching them, great cost of carriage thence over almost impassable roads, absence of machinery for draining and manipulation; but, above all, the extraordinary apathy of Irish capitalists, and the worse than unwillingness of the Irish land proprietors to encourage the development of these vast and valuable resources. Most of these obstacles, however, have disappeared; the rest are being fast overcome.

The facilities now afforded by steam power and improved adaptations, the extension of railways, the great improvements in high-roads in every part of the land, and consequent ease of locomotion, have effected a noble and striking change; the wonderfully increased and daily increasing intercourse with England and Scotland, but, paramount, the great change in social habits, the barriers of prejudice being daily broken down, hold out high promise for the future in this section of Ireland's native wealth.

At the late International Exhibition in Dublin, not the least important or interesting of the exhibits, considered either as a national or social matter, was that of the mineral produce of the country; displaying as it did undoubted evidence of the surpassing richness of the ores. The splendid cake of metallic silver will be well and long remembered by all who saw it; whilst the less attractive, but still equally valuable though less showy specimens of lead, copper, and other ores, were to the thoughtful and understanding visitor equally suggestive as practical sources of obtaining wealth by labour and capital.

The variety and number of minerals of value that have been detected in Ireland in remunerative quantities and qualities are also surprising to those who have not had opportunities of ascertaining the facts, or have judged of them without considering them from the point of view in which we endeavour to present them (which we hold is the true one), in carrying out the principles we profess to advocate. In addition to the valuable ores of copper and sulphur in Wicklow, Tipperary, Kerry, and Cork, lead veins containing large proportions of silver have been found; rich mines of silver lead have been wrought in the counties of Down and Monaghan, where (particularly in Monaghan) noble veins of the rather rare mineral, antimony, have been met with. Some of these were worked for that substance a few years since by an Englishman, at a good profit—though carried out on a limited scale, with inadequate means and very primitive appliances. At his death the works fell into abeyance, and have not been resumed. The great bulk of this mineral has now to be imported into England and Scotland from Borneo and other parts of the East Indies; there are small parcels sent from Cornwall, but the deposits there are uncertain, and are not in well-defined lodes, as in Ireland. Owing to the great extension of the Britannia metal and type-founding trades of Sheffield, Edinburgh, and other parts, the consumption has enormously increased, antimony being used in hardening the alloys of lead, tin, and zinc used in casting.

Blende, the ore of zinc, of very excellent quality, has been found in Ireland, and is now being wrought in some few places. The use of this mineral has more than quadrupled within the last few years; at present it forms so great an item in many English, Welsh, and Manx lead and copper mines, as to enable the proprietors to pay handsome dividends, whereas it had previously been considered a drawback, by depreciating the value of the ores with which it was

associated; what was thrown aside as useless in 1858, brings £4 per ton in 1865, with every prospect of an increased price.

Nor should the production of Ireland's coal measures be here over-looked or despised; the time is fast approaching when Ireland's coal measures will have that scientific practical attention and that extensive outlay of capital expended on them which their importance deserves; these must, of course, be the work of time to fully develop; great will be the amount of prejudice and interested motives to be overcome; vested rights and established connexions will have to be encountered in these, as in all other comparatively new undertakings; still, in the end, facts and figures will prevail and convince; the brilliant successes already accomplished by well-directed operations in carefully selected situations must and will command attention; this once effected, we have no doubt for the future.

Nothing, in our opinion, would be more unfortunate, or militate more seriously against permanent success and real benefit, than any indiscriminate and too sudden an impulse to Irish mining pursuits. We are far from advocating any such measures, knowing as we do the consequences resulting from precipitate expansion of any description of undertaking to an undue extent, and the reaction as certain to follow; yet in these industries, if carefully and wisely carried out, we maintain are the elements of great and lasting benefits for all classes in Ireland.

While England, France, Belgium, America (none of which surpass this country, were her minerals developed) are enjoying unheard of prosperity from their mining industries, and are using every conceivable endeavour and method to forward their further development, raising capital in every money market in the world for that purpose, it would appear strange indeed were Ireland to continue apathetic with all her many and peculiar advantages.

The aptitude of the Irish labourers for such pursuits as quarrying and mining is well known and admitted, both *at home and from home*. When properly instructed, they make workmen in all respects equal, in many superior, to the average of the men amongst whom they are employed, especially for the harder and more dangerous portions. The rate of wages usually paid to men engaged in the various departments is greatly in excess of that paid to the common field labourer, enabling them to obtain not only the ordinary daily necessities and comforts, but many of the luxuries of life. The most cursory ramble through a mining district or village will convince the most sceptical of the manifold advantages which the employment confers; the respectable appearance of the inhabitants, the superior amount of intelligence in the class are obvious; the very nature of their work necessitates thought, calculation, and steady conduct, begetting and inspiring self-respect and well-regulated lives; these circumstances account for, and are the true reasons why so many agents and managers of mines and kindred occupations are selected from the working miners and quarrymen of Cornwall, Devonshire, and Wales, who obtain very high wages, and are sent to all parts of the world. In Australia, Brazil, Spain, &c., even in Ireland itself, most, if not all the agents, superior officers, and workmen, are from Cornwall. Why should this be? why should not Ireland enjoy her quota of home and self-created agents? There can be no valid reason why not, were but the trial made. There may be some silly, senile idea still lingering, that these professions are beneath and unworthy the attention of educated youths. We beg them to dispel such antiquated foolish thoughts; there are ample opportunities for distinction and lucrative employment singularly well adapted to the sanguine, impulsive temperament, and quick perceptive powers of the sons of Erin, by which they may take equal rank in this with any of what are called the learned professions—that, too, at a great advantage, as the attainment of these sciences does not require one-third of the cost in preliminary probation. The extent of employment in manual labour should be another national consideration, seeing that in the county of Cornwall alone there are no less than 30,000 miners, in England more than 500,000 miners, colliers, and quarrymen; whilst the number dependent on these pursuits for their livelihood—that is to say, indirectly employed, such as blacksmiths, joiners, carriers, sailors, and the like—swells the amount of honestly employed labourers to considerably more than one million of individuals! Nor are these, great as they are, all the advantages in a national point of view; the *dues* payable to the landed gentry of England from the produce of the minerals, quarries, and clays, amount to six million of pounds annually!—a sum that is truly surprising. The effect in Ireland of such industrial experiences would, we opine, be to cause absentee or careless landowners to become resident close observers of their properties; to cause emigration from want of employment to almost if not entirely, cease; to do for Ireland what these industries have done for and are accomplishing in all countries where practised—spreading wealth, industry, contentment, in all directions, but more especially in the spots so highly favoured by Providence, and so sadly neglected. It would afford us infinite pleasure to witness the realization of such glorious ideas; that they are not only possible, but are probable, we know; we also know there is a growing disposition on the part of the English capitalists to embark in Irish industries of the kind we have thus expatiated on. It is one in which we take a lively interest, feeling as we do, that it is one of nature's wise provisions for Ireland's welfare.

*Metals and Mineral Productions of Ireland.*—Iron ore is found in the localities of coal. In 1861 there were but two mines working, and they produced 165 tons of ore, worth £66; in 1864, 60,602 tons, value £20,326. Considerable quantities of black-band iron-stone are now shipped from Belfast to Scotland.

Iron Pyrites.—From the mines of Wicklow there were obtained in 1861, 91,803 tons of iron pyrites, value £52,768; in 1864, 66,894 tons, value £37,320.

Tin stone has been found in the auriferous soil of Wicklow, but no veins or working deposits have been discovered.

Zinc.—At Silvermines, County Tipperary, 540 tons were obtained in 1860; and at Milltown, County Clare, 40 tons; total value, £1,160. In 1861, 890 tons were obtained at Silvermines, value £1,780; and in 1864, 3,500 tons, value, £9,215.

Salt.—Rock-salt has been raised at Duncrue, near Carrickfergus. The quality is superior, and the quantity obtained in 1864 was 17,245 tons; of this there were refined 4,445 tons. Belfast exported, in 1861, 11,288 tons; 1862, 11,752 tons; and in 1863, 15,662 tons.

Other minerals and quarries.—Sulphur, manganese, antimony, alum, nickel, tin, with clays of various kinds, are obtained in several places; and there are valuable quarries of marble, slates, flags, &c.

The marbles of Ireland are a valuable, and, we regret to say, an unworked treasure. These, like some valuable ornamental stones in Ireland, equal to, though not exactly like, Portland, may be comparatively disregarded until an increased circulation of money leads to the use of more ornamental works in the inside and on the exterior of our dwellings. At the same time, it may be well to say that, for all kinds of marble, except pure white, Ireland cannot be surpassed in any part of Europe. But there is pure white marble near Dunlewey, in Donegal. There is also a specimen at the same place, which, except for its approaching a dove colour, might compare with the marbles of Carrara. It is a mere question of taste, however, and one on which there ought to be room for difference of opinion as to whether the colour of the Irish be not more chaste and elegant than that of the Italian marble. But leaving this point, at which we only desire to glance, there can be no controversy about the black marbles of Kilkenny, Cork, Galway, &c., the green and variegated of Connemara, and the several kinds of so many shades to be found in Armagh and other parts of the country. Neither England nor Scotland can compete with Ireland for marbles. It is probable one of the most cheering signs of the day for Ireland that notice is being taken of her marbles, and it augurs well for the future that a trade is springing up between several parts of Great Britain and this country for these valuable resources of industry.

It is, however, to be regretted that so few Irish people make the working of marble quarries a source of employment. If capital were put into these to a sufficiently large extent, and that along with the supply of chimney pieces, &c., marble were worked into personal and household ornaments, there can be no question but with that enterprising, persevering, and painstaking industry which are now necessary to all success, the marble business of Ireland might be made to occupy a high position as a branch of trade. The localities of marble are favourable for export. They are also suggestive of immediate action, because they are in the parts where trade is worst, and into which it is most desirable more means of employing labour, skilled and unskilled, ought to be introduced. The only hindrance in the way is the absence of enterprise.

#### IRISH MINES.

The following is a list of the various mines in Ireland, and the minerals chiefly raised :—

Mines, and Situation	Minerals raised	Company or Proprietor
1 Annaghlongh, Clare, . . .	Lead, . . .	—
2 Ballinac, . . .	Copper and pyrites,	General Mining Company.
3 Ballycummiak, Cork, . . .	Copper, . . .	Captain W. Hyde.
4 Ballycorus, Dublin, . . .	Lead, . . .	Mining Company of Ireland.
5 Ballydehob, Cork, . . .	Copper, . . .	Wm. Hobson and Company.
6 Ballygahan, Wicklow, . . .	Copper and pyrites,	Henry Hodgson.
7 Ballyhickey, Clare, . . .	Lead, . . .	Suspended.
8 Ballynagniff, Galway, . . .	" . . .	Captain Thom.
9 Ballymurtagh, Wicklow, . . .	Copper and pyrites,	Wicklow Copper Mining Company.
10 Ballynafunshogue, do, . . .	Lead, . . .	Henry Hodgson—suspended.
11 Ballyshannon, Donegal, . . .	" . . .	Suspended.
12 Ballyvergin, Clare, . . .	" . . .	D. J. Macdonald.

## IRISH MINES—Continued.

Mines, and Situation	Minerals raised	Company or Proprietor
13 Bannishall, Cork, . . .	Copper, . . .	Bannishall Mining Company.
14 Bantry Lead Mine, Cork, . . . (KILLVENOGUE.)	Lead, . . .	Martyn, Dennis, and Company.
15 Bearhaven, Cork, . . .	Copper, . . .	Purley and Company.
16 Brandon Barytes, Cork, . . . (DRENNALAMANE.)	Copper and barytes,	Martyn, Dennis, and Company.
17 Brow Head, Cork, . . .	Copper, . . .	Brow Head Company.
18 Cahenglassaun, Galway, . . .	Lead, . . .	T. M. S. Taylor.
19 Caimo, Wexford, . . .	" . . .	Mining Co. of Ireland—suspended.
20 Cappagh, Cork, . . .	Copper, . . .	—
21 Carberry West, Cork, . . .	" . . .	Carberry West Company.
22 Carysfort, Wicklow, . . .	Lead and pyrites, . . .	Carysfort Mining Company.
23 Castletown, Clare, . . .	Lead and zinc . . .	Colonel M'Namara.
24 Castleward, Down, . . .	Lead, . . .	Castleward Mining Co.—suspended.
25 Clonkeen, Wicklow, . . .	Lead and barytes, . . .	Suspended.
26 Cloughleagh, " . . .	Iron and manganese,	A. Illingworth.
27 College Mines, Armagh, . . .	Lead, . . .	—
28 Connorree, Wicklow, . . .	Pyrites, . . .	Connorree Mining Company.
29 Cooney, and Long Island, Cork, . . .	Copper, . . .	Cooney and Long Island Company.
30 Cronebane, Wicklow, . . .	Pyrites, . . .	Williams and Company.
31 Crookhaven, Cork, . . .	Copper, . . .	A. C. Langton and Company.
32 Cullentraph Park, Wicklow, . . .	Lead, . . .	Suspended.
33 Derrycarhoon, Cork, . . .	Copper, . . .	Swanton and Company.
34 Dhurode, " . . .	" . . .	J. Butler.
35 Dundalk, Louth, . . .	Lead, . . .	Suspended.
36 East Shallee, Tipperary, . . .	" . . .	General Mining Company.
37 Gallynafunshogue, . . .	—	—
38 Galway Mines, Galway, . . .	Lead, . . .	Suspended.
39 Garryard W., Tipperary, . . .	" . . .	General Mining Company.
40 Gartydonagh, Cork, . . .	" . . .	Zohrab Holmes and Company.
41 Glandore, " . . .	Manganese, . . .	Tonken and Company.
42 Glenanlin, " . . .	Copper, . . .	Glenanlin Company.
43 Glengola, Galway, . . .	Lead and pyrites, . . .	G. F. O'Flahertie.
44 Glenmalur, Wicklow, . . .	Lead, . . .	Henry Hodgson.
45 Great Cappagh, Cork, . . .	Copper, . . .	Cave and Company.
46 Gurtadyno, Tipperary, . . .	Lead and pyrites, . . .	General Mining Company.
47 Gurtyrallig, Cork, . . .	Copper, . . .	Carberry Mining Company.
48 Hibernian, . . .	Lead, . . .	W. Thomas.
49 Hope, Dundalk, . . .	" . . .	Hope Mining Company.
50 Horse Island, Cork, . . .	Copper . . .	T. S. Cave and Company.
51 Irish Consols, " . . .	" . . .	Irish Consols Company.
52 Kibarry, " . . .	" . . .	Kilbarry Mining Company.
53 Kilcoe, " . . .	" . . .	Mining Company of Ireland.
54 Killeen, " . . .	" . . .	Killeen Mining Company.
55 Knockatillane, Wicklow, . . .	Iron and manganese,	Dean of Clogher.
56 Knockmahon, Waterford, . . .	Copper, . . .	Mining Company of Ireland.
57 Kieldrum, Donegal, . . .	Lead, . . .	" " " suspended.
58 Kilbrin, " . . .	" . . .	Suspended.
59 Kilbricken, Clare, . . .	" . . .	Suspended.
60 Lackamore, Tipperary, . . .	Copper . . .	Miss Hamilton.
61 Lansdown, Kerry, . . .	Lead, . . .	—
62 Luganure and Glendalough, Wicklow, . . .	" . . .	Mining Company of Ireland.
63 Milntown, Clare, . . .	Lead and zinc, . . .	Clare Mining Company.
64 Mizen Head, Cork, . . .	Copper, . . .	Swanton and Company.
65 Mount Gabriel, Cork, . . .	" . . .	Mount Gabriel Mining Company.
66 Newtownards, Down, . . .	Lead, . . .	Newtownards " "
67 Renville, Galway, . . .	Lead and pyrites, . . .	Suspended.
68 Roaring Water, Cork, . . .	Copper, . . .	Roaring Water Company.
69 Scart, " . . .	Lead, . . .	Boyle and Company.
70 Schull Bay, " . . .	Copper, . . .	Schull Bay Mining Company.
71 Shallee, Waterford, . . .	Lead, . . .	General Mining Company.
72 Silvermines, Tipperary, . . .	Zinc and lead, . . .	" " "
73 Tassan, Castleblaney, Monaghan, . . .	Lead, . . .	Castleblaney Mining Company.
74 Tigrony, Wicklow, . . .	Pyrites, . . .	Williams and Company.
75 Tynagh, Galway, . . .	Lead, . . .	T. Evans—suspended.
76 West Shallee, Tipperary, . . .	" . . .	General Mining Company.

## THE FOLLOWING ORES WERE SOLD IN IRELAND IN 1864 :—

	Lead Ore		Lead		Silver
	tons	cwts.	tons	cwts.	oz.
1. ARMAUGH.—College Mines, - - -	5	0	5	0	23
2. CLARE.—Milltown, - - -	4	10	2	15	
3. CORK.—Carrohan, - - -	—	—	—	—	—
4. LOUTH.—Hope (Dundalk), - - -	25	0	19	0	215
5. MONAGHAN.—Tassan, - - -	80	0	60	0	300
6. „ Coolartin and Bond, - - -	20	0	15	10	86
7. DOWN.—Newtownards, - - -	127	0	97	15	194
8. „ Castleward, - - -	—	—	—	—	—
9. WICKLOW.—Carysfort, - - -	40	0	31	0	290
10. „ Luganure, - - -	1,642	0	1,050	17	10,500
11. „ Glenmalure, - - -	100	0	60	0	150
12. WATERFORD.—Shallee, - - -	155	10	101	10	3,746
	2,202	0	1,441	7	15,534

SOLD BY PRIVATE CONTRACT		Copper Ore	Fine Copper (estimated)		
		tons	cwts.	tons	cwts.
BALLYMURTAGH, - - -		150	0	4	10
„ Precipitate, - - -		10	0	0	18
„ Coppery pyrites, - - -		1,100	0	11	0
BALLYGAHAN, - - -		2,357	0	23	10
CRONKANE and TIGRONY, - - -		111	0	1	17
CONNORREE (Precipitate), - - -		16	0	6	0
		3,744	0	47	15

1 AUSTINE & Co. 20 Dixon st. Glasgow.—Block of coal.—(In West Verandah).

2 CARRICK, R. Pirnie Colliery and Chemical Works, Methill, Fife, N.B.—Cannel coal; oil and grease manufactured from the above coal.—(West Verandah).

COAL PRODUCTION OF THE UNITED KINGDOM.—The rate of increase in the production of coal in 1864 was more rapid than in any previous year, as the following figures will show :—

1861, - - -	85,635,214 tons.
1862, - - -	88,638,838 "
1863, - - -	88,292,515 "
1864, - - -	92,787,873 "

The value at the pit's mouth of this enormous quantity was £23,197,968. The produce in each locality, in 1864, was as follows :—

Durham and Northumberland, - - -	23,248,367 TONS.
Cumberland, - - -	1,380,795
Yorkshire, - - -	8,809,600
Derbyshire, - - -	4,470,750
Nottinghamshire, - - -	796,700

Carried forward, - - - 38,706,212

Brought forward, - - - 38,706,212

Leicestershire, - - -	890,500
Warwickshire, - - -	754,000
Staffordshire and Worcestershire, - - -	11,459,851
Lancashire, - - -	11,530,000
Cheshire, - - -	822,750
Shropshire, - - -	1,150,000
Gloucestershire, Staffordshire, & Devonshire, - - -	1,950,000
Monmouthshire, - - -	4,028,500
South Wales, - - -	6,948,000
North Wales, - - -	1,987,060
Scotland, - - -	12,400,000
Ireland, - - -	125,000

Total Produce of the United Kingdom, 92,751,873

3 CONNORREE MINING CO. LIMITED, OROCA, Co. Wicklow.—Native copper; oxide of copper; sulphuret of copper; copper precipitate; silver lead ore; sulphur ore; iron pyrites; sulphur smalls; ochre.

4 GENERAL MINING CO. FOR IRELAND (LIMITED), 29 Westmoreland st. Dublin.—Raw and dressed calamine; arsenical pyrites; fire-clay; ochre; oxide of zinc; lead and copper ores from the Company's mines.

Quantity and value of Irish copper ores sold at Swansea, from 1853 to 1864:—

YEARS.	TONS.	VALUE.
1853 - -	11,485 -	£116,389
1854 - -	11,739 -	£128,653
1855 - -	12,381 -	£125,981
1856 - -	11,590 -	£115,398
1857 - -	8,008 -	£98,500
1858 - -	10,521 -	£96,344
1859 - -	10,869 -	£108,172
1860 - -	14,245 -	£130,793
1861 - -	13,971 -	£132,565
1862 - -	13,729 -	£125,401
1863 - -	14,815 -	£126,083
1864 - -	14,237 -	£122,171

5 LISABE, F. C.E. 19 Westmoreland st. Dublin.—Slates, alabs, flags from Gooladoo quarry, co. Cork; ores of copper, lead, iron, baryta; fluor spar; sulphur; quartz containing gold, from mines in Cork and Clare.

Gold, though it exists in Ireland, is at present of but secondary value to manganese and very many other minerals used in the arts, and which will be evidently more important as those works go on which must precede the development of such, however largely to be found in Ireland.

A brief parliamentary paper on the "Royalty," payable to her Majesty on the mines of the United Kingdom, sets down as the total received from Ireland in three years only £70. This sum is specified as the royalty paid on gold and is thus distributed:—in 1860-61, £20; 1861-62, £50; and in 1862-3, £10. As the Royalty is the tenth part of the gross produce, we have the produce of all the gold mines in Ireland for three years equal to £700.

The Royalty on "gold and silver" received from Wales during the same three years was £13 6s. 3d.; £503 5s. 7d.; and £2,005 10s. 2d. Thus while the produce of the Irish mines is diminishing, that of the Welsh gold and silver mines is very largely increasing. Gold is not mentioned among the minerals produced in England.

That gold existed in large quantities in Ireland some centuries ago is abundantly proved by the vast quantity of golden ornaments discovered. It is not reasonable to suppose that the ancient Irish exhausted completely the native gold beds. In Wales gold is now obtained in large quantities from places where its existence had never been suspected. But in Wales capital is expended and modern machinery has been introduced. We suspect that if the same energy and means were devoted to the development of the Irish gold mines the produce would be very much greater than it is.

6 MINING COMPANY OF IRELAND, 30, Lower Ormond quay, Dublin.—Copper ore from Knockmahon, co. Waterford, showing the different forms in which it is found in the rock, and the various stages it passes through in dressing and preparing for market; lead ore in like manner; coal and strata illustrative of the geological formation of the coal fields of the Company in the co. Tipperary; silver and lead in pig, sheet, pipe, shot, red lead, &c., manufactured from Irish ores at the Company's Works, Ballycorus.—(Narc).

The display of the Mining Company of Ireland was the largest and most important of all. In addition to several fine specimens of copper ore from Knockmahon mine, county of Waterford, showing the different forms in which it is found in the rock, and in the various stages it passes through in dressing and preparing till the article ready for the market is produced, we have examples of lead ore in a like manner, and several large blocks of coal and slate from the Slieveardagh colliery, illustrative of the geological formation of the company's coal fields in the county Tipperary. Besides these there were on view, specimens of fluor spar coated with crystals, of calc spar, and of stones from Luganure mine, sparkling with silver lead ores. Then we have the manufactured lead, neatly made up as pig, sheet, and pipe lead, and again as shot of various sizes, all being

produced at the company's works, Ballycorus. All these exhibits appear to be of the very best quality; and this observation applies especially to the sheet lead intended for chemical purposes. Besides copper, silver is found, and sometimes extensively, in the Company's mines. A striking object in the spacious glass case filled with their exhibits was the large and fine cake of pure silver, extracted from the ore, weighing 4 cwt. 2 qrs. 11½ lb., containing 7,514oz., troy, the value of which is £2,066. There were also bars of silver and specimens of the ore, beautified by the iridescent colours formed on their surfaces in the desilverizing process. Altogether the show case of the Mining Company of Ireland contained a most interesting and valuable collection of the products of their mines.

7 BANDON, EARL OF.—Roofing slates from the works of the Rossmore Slate Company (Limited), Carrigbue, near Bantry, co. Cork.—(*In West Verandah*).

8 CARYSFORT MINING CO. (LIMITED), 65 Dame st. Dublin.—Copper and other ores; native gold.

In 1796 native gold was discovered accidentally in the Ballinvalley streams at Croghankinsella, co. Wicklow; and the country people, neglecting the land, were occupied in collecting it for nearly six weeks, when operations were commenced under direction of Government. Regular works, then established, were in operation until destroyed during the rebellion of 1798, at which time the outlay had been reimbursed and a profit realized. In 1801 the working was resumed; but as no gold was found in the solid strata, and the alluvial deposits did not afford a return sufficient to defray expenses, the working was abandoned.

The Carysfort Mining Company have been lately working the Wicklow gold fields. The object of the Company in their explorations was to discover if there were in existence, at or near the surface of the land, a vein of quartz or other mineral, from which the gold, that was now distributed over the surface of the land, originally emanated. They have examined the rock wherever it was laid bare by nature, and have inspected numerous veins of quartz; they have blasted portions of rocks, and have crushed the quartz. Some of the more promising lodes of quartz have been pierced by shafts of a couple of fathoms deep. As yet, however, no stone containing gold has been found in the Croghankinsella district—that is, nothing which could be properly called a vein of gold-bearing stone. The searches which had been made into the deposits in the valley showed a wide distribution of the particles of gold. Of those particles which could be called nuggets, the larger were found at the upper parts of the streams towards their sources; and as they descended the streams, the particles became much more minute. That was not, perhaps, an absolute rule, but was generally the case. From the facts which had been brought to light—from the examinations which he had himself made, and from the reports we heard, we have no doubt whatever that the original source of the gold is high up towards the sources of these streams. It is reasonable to suppose that the smaller particles should be more easily swept down, while the larger masses should hold their position amongst the rocks during a series of ages. Therefore they should look for the original source of the gold, not in the valleys below, but in the upper part of the Croghankinsella mountain. The question is, how was the presence of gold in the Croghankinsella valley to be accounted for. Hitherto the gold found in Wicklow has been found in the streams, or taken from the washings of gravel or dirt, as the miners called it. The company has "costined" the surface of the mountain to a considerable extent, but up to the present they have not succeeded in discovering the lode from which the gold originally proceeded. In working at the lower portions of the rivers they had sunk shafts under the soil to the rock below, and had from thence collected gravel, from which gold has been washed out. Lately a discovery has been made on their property of a very large "goosan" lode. This was a lode which must have at one time contained

gold, but the gold has been washed out, or otherwise eliminated during a long course of ages, leaving nothing behind except an ochrous matter.

It was lately stated in the *Field*, that no gold had been found in Ireland, and that the gold used in the manufacture of the antique Irish ornaments, which were preserved in museums, was brought here by foreign merchants, who took in return for it the inhabitants of the country, who were sold to them as slaves by the lords of the soil. In reply to, and in contradiction of, this statement, Mr. Gilbert Sanders exhibited recently, at the Royal Dublin Society, the result of a smelting he had himself made, in the shape of a large mass of gold. This he stated had been obtained from Carysfort materials. A large mass of gold was also shown by Mr. Sanders at a meeting of the Carysfort Mining Company. The mass now exhibited was the additional result obtained from operations which Mr. Sanders then stated that he had not had time to finish. It was valued at £120.

Mr. Scott exhibited at the same meeting a nugget, and a model of a nugget, the former of which, and the original of the latter, having been taken from the Wicklow district, in the year 1796, shortly before the breaking out of the rebellion. The "model" is a gilt leaden image of what was the largest nugget of gold ever found in Europe, and which weighed 22 ounces. Several other models of the same nugget, which is a genuine sample of the Wicklow product, now belong to the mineralogical collection of the Royal Dublin Society. It consists of a mass of gold, through which a vein of quartz runs, and was found by Mr. Scott to weigh 1,500 grains. The late Mr. J. Knight Boswell had in his possession a beautiful specimen of Wicklow gold—a piece of quartz, with gold all round it, which was evidently the effect of water. He had formed the opinion that the gold came from the quartz reefs of the district, and that whoever should discover those quartz-bearing reefs would make a princely fortune; and he never changed that opinion. He believed that at a very remote period, when the surface of the soil there was utterly destitute of vegetation, masses of gold were carried from the upper parts of the mountain downwards by the action of water. In the course of subsequent ages a deposit of vegetable matter or peat had accumulated, to the depth of from fifteen to twenty feet, so as to hide the site of the original quartz reefs. A family named Byrne, who were farmers at Croghankinsella some thirty years ago, said that in the upper part of one of the rivers they found a mass of metal, about a pound and a-half in weight, which they supposed to be copper. It remained for several years in their possession, and was used by them as a weight; but at length it was disposed of to a travelling tinker, who carried it to Dublin, where he sold it for a large price to a jeweller in Capel-street. That was what led to the Government investigations there in 1796; and it was stated, on the authority of government, that at that time, during a space of two months, £10,000 worth of gold was purchased from the people of the district by jewellers in Dublin.

**9 KELLY, J., C.E.**—Compressed peat, and iron manufactured therewith—(*West Verandah*).

Coal fields in Ireland are found in the following counties:—Carlow, Kilkenny, and Queen's County, Tipperary, Limerick, and Cork, Antrim, Tyrone, Cavan, Leitrim, Sligo, and Roscommon. Of the 73 collieries 6 are in Ulster, 7 in Connaught, 31 in Leinster, and 29 in Munster, but only 39 were working in 1864; the produce raised in 1864 was 70,000 tons of anthracite and small coal, and 55,000 tons of bituminous coal.

Lignite, an intermediate species of fuel between wood and coal, is found in dense strata encompassing the southern half of Lough Neagh.

The total area of turf or peat bog is estimated at 2,830,000 acres, nearly one seventh of the island. Of this total 1,576,000 acres are flat bog, spread over the limestone plains; the remaining 1,254,000 acres are mountain bog.

The bogs of Great Britain and Ireland cover, together,

an area exceeding five millions of acres, the average depth of which may be taken at twenty feet. Nature has thus supplied us with the means of adding to our stock of fuel some twenty thousand millions of tons.

In Ireland about a million and a-half of acres have been thoroughly surveyed. In the reports of these surveys it is stated that beneath the peat an excellent soil, well situated for drainage, was found fit for arable or pasture land.

Many of the kinds of artificial fuel, brought into use within the last few years, contain peat as one of their ingredients. One of the Irish Steam Packet Companies employs fuel made in the following way. The peat, after being dug up, is heavily pressed by iron rollers, drained of its moisture by a hydraulic press, dried, and converted into a kind of coke or charcoal in an oven. Then, to make the artificial fuel, this coke is ground to powder, and mixed with melted pitch and resin to the state of a paste, which is at once cast into moulds, and made into brick-shaped blocks. There is, however, great difficulty in drying most of the Irish peat into fuel, on account of the large quantity of water it contains. Oram's patent fuel comprises the screenings from coal pits, mixed with various kinds of earthy and bituminous matter. William's patent fuel presents the forms of an artificial coal, an artificial coke, a charcoal harder than wood charcoal, or a dense peat fuel, according to the mode in which it is prepared. Bethel's patent fuel consists of small coal, coke dust, cinder siftings, and pitch or coal-tar. Warlich's patent fuel made of materials similar to the above, is especially intended for marine steam-engine furnaces.

Peat has been long dug out by the farmers in "soda," and used for firing; latterly it has been squeezed into portable shapes, and made into convenient forms. Efforts have been made to extract oil from it; and candles have been made from peat. It has also been utilized for carburetted hydrogen gas, used for both light and fuel. One of the latest modes of making it do duty is the adding of the pitch of gas tar, by "Horsfall's Patent," to the peat, and thus increasing its quantity, rendering it more durable as a fuel. But we have no concern with any of these, except in so far as to forbid, in the name of cheap fuel for all classes—to promote the ends of good cooking—in the interests of gastronomy, as well as for the objects of making the homes of Irish people more cheerful—that no coal, peat, lignite, timber, or any other article of fuel be employed for any purpose which may be served as well some other way, except that of the hearth fire, the kitchen, the drawing room, and wherever else it may be required for domestic and personal uses. The bogs of Ireland are amongst the country's richest treasures. Her coal, though it covers but a few acres, is just the kind most to be desired; and, though neither of these need be burned except for smelting, locomotion, and forge fires, however extensively Irish manufacturing may grow, yet, had a kind Providence not so blessed this favoured island as to give us these classes of fuel, all our prospects would have been less or more chilled, if we could not say, as we can this day, *Ireland is rich even in fuel*.

Mr. W. G. Crory, writing on this subject, says:—"Of all the sources of industry in Ireland none deserves a higher place than peat. In the immense quantity of this most valuable article in the bogs of Ireland there is the means of industrial power, and consequently of wealth, beyond all calculation. The bogs most valuable in an industrial sense lie south of Dublin and west of the Shannon. These would yield fuel for many years to come, and this fuel for domestic use would be both cheaper and more easily obtained than sea coal."

Many projects have been started for getting its valuable products from peat. The experiments designed to utilize peat as fuel have succeeded best, and the present circumstances of the country afford a suitable opportunity for the further adoption of peat fuel, if not its substitution, for coal for house purposes. Coal usually ranges at from 15s. to 20s. per ton, in towns near the

bogs of the west; in which towns peat fuel for domestic use might be sold at 10s. to 12s. per ton. The outlay of a few thousand pounds in making "ways" to the bogs, and erecting machinery for compressing the peat, may bring this article into every town in Ireland. The utilisation of Irish bog, to the production of an abundance of cheap fuel, must be conducted on a large scale, and in something like the way English and Scotch people go into coal mining. The preparing of peat for fuel might, in fact, be made a most extensive source of industry. Not only might the towns of Roscommon, Galway, Mayo, Limerick, &c., be supplied with cheap fuel from the western bogs, but the price at which peat fuel could be sold would bring it largely to Dublin, and just as coals are sent to various places now, peat fuel might be sent to displace their use. The several smaller bog districts would also come in for a share in trade, just as the several smaller coal districts in England get a part of the general business. In places approachable from each bog there would be a brisk competition. Besides, the variety in quality of the several bogs would produce a list of descriptive names to suit purchasers, just as those attached to coal. Manufacturing in the article might be carried on every day in the year. Even if stocks of peat fuel were not gathered in several towns against severe weather, it would be easy for merchants to get supplies at a day's notice, so that *famine prices for fuel* would not be likely to occur often, if at all, even in the severest season.

To put a supply within reach of the poor, who often suffer from the want of it, seems so much a duty that but few approach the subject of Irish bogs without feeling in some degree in danger of meeting with an appeal in behalf of the poor. Therefore, many who willingly invest money in coal mines in England, or engage in the coal trade to make money at home, never think seriously about the possibility of getting a larger interest for their capital by putting it into "bogs," and making more by dealing in the home-made peat fuel than they can in sea coal. If the money belonging to Irish capitalists, directly and indirectly employed in English and Scotch coal mines, were transferred to Irish peat bog manufacture, it would be nearly, if not fully sufficient, for their development, and would pay the capitalist at least 2 or 3 per cent. per annum more. Besides, so long as the business carried on in fuel is confined to trading in, or even importing coal, it can never afford either such scope for commercial enterprise, or give such reward for labour, as if like enterprise and industry were employed on a home-made article. English coal would really have no chance of beating manufactured Irish peat fuel for Irish consumption, provided both could be had in such quantities as would give consumers a chance at all seasons of the year.

An export trade to no inconsiderable extent might also be carried on in peat fuel to America, and even in England. But, as the supply of our home demand is so important, it would be for a long time the most profitable. Farmers would gain most by an increased supply of cheap fuel. Many articles of cattle and pig feeding require to be cooked, and the cost of fuel enters largely into the question of using certain kinds of feeding. Indian corn, where fuel is cheap (in Lancashire and Yorkshire, for example), is largely employed for cattle, pigs, and even horses, always steamed or boiled. Egyptian beans, and several other kinds of hard pulse of great value in feeding, may be greatly improved by steaming or boiling. These are most in use where fuel is the cheapest, and churning, threshing, and several other works about a farm, are done by steam-power (or might be, if fuel were cheap and plentiful); and, therefore, to farmers, whether large or small, to dairy-keepers, and all who feed cattle, pigs, or beasts of any kind, cheap fuel is a boon. But not only for these uses, but also and most particularly for manufacturing purposes, peat fuel is decidedly better than coal. Several manufactories requiring cheap fuel might be started in Ireland for the sake of the peat.

The diffusive character of heat by peat makes it highly valuable for some purposes, and the greater absence of corrosion on the outside of boilers heated by peat, as compared with those heated by coal, makes it more valuable than coal in this respect also.

Although it is well known that the same money's worth of peat will make more steam than that of coal, and especially if mixed with anthracite coal (which is abundant in Ireland), still it is strange that the notion exists amongst those who know little of Irish resources, that Ireland has been outrun in the race of manufactures for want of fuel! The fact is, had the peat bogs of this country, situated as they are so favourably for the western export trade, been economized, Ireland might have entered into successful competition with England in the cotton and woollen trades, even by steam-power. In such a case Irish fuel would have been as plentiful as English, and mills worked near the borders of Connaught might have had their engines fired as cheaply as those in the Manchester coal field. But as water-power is so much cheaper than steam-power, however cheaply generated, there is in the apathy of our people in regard to the utilisation of peat for steam purposes the less to regret, as it may yet be used for other purposes. Steam-boats on our lakes and rivers are becoming more numerous. These are generally worked by peat, even in its bulky state; but peat fuel also suits railways. Testimony in regard to this as founded on experiments recently made, is very decidedly in favour of peat, as compared with even the best qualities of coal. After a trial on the Belfast and Northern Counties Railway, it has been certified by Messrs. Alexander Yonston, locomotive engineer, W. H. Stephenson, engineer, R. D. Donville, resident engineer, all of Belfast, "That, having carefully noted all facts, we have no hesitation in saying that we consider the condensed peat in every way well adapted as a fuel for locomotive purposes." At this trial 14 cwt. 1 qr. 14 lbs. of peat fuel was used to drive a train (including engine and tender) of 70 tons, 74 miles. The speed attainable at any time the pressure was allowed to rise to 120 lbs. was 40 miles per hour. Experiments made on marine engines are equally satisfactory; so are those made at corn-mills or factories of any kind. The utility, therefore, of peat in a condensed form for steam purposes, is admittedly even greater than that of the best steam coal. In fusing iron, also, peat is superior to coal. This has again and again been proved by experiments; but, as the Irish peat bog question has been allowed to rest, and, as it is most probable that all projects for its future utilisation should stand on authority which cannot be gainsaid, we give the following quotation from a report on five samples of peat such as might be had in fifty places in Ireland, and to an extent to justify the adoption of the most improved machinery, and the erection of the most permanent works, for its condensation.

*Boiling, evaporating, and fusing properties of five samples of Peat Fuel as compared with Coal, the same Quantity of each in Weight being used.*

Fuel	Time in which of water was brought to boiling point	Time in which of water was evaporated	Time in which com- plete fusion was effected
Coal, good furnace	6 minutes	14 minutes	31 minutes
Peat, No. 1, -	1½ "	6 "	14 "
Peat, No. 2, -	1 "	7 "	17 "
Peat, No. 3, -	1 "	7 "	16 "
Peat, No. 4, -	1 "	6 "	17½ "
Peat, No. 5, -	1 "	5 "	12 "

All the samples of condensed peat tested in the above experiment were produced from the same bog, and were of fair average quality. They were treated differently, having been subjected to different degrees of heat in the process of drying; consequently the difference in their results is due to their mode of treatment, and not to any difference in the quality of peat. It will be observed that each of the five samples of peat raised the heat of water to boiling point in about one-sixth of the time required when using coal, and that the same quantity of water which was evaporated in fourteen minutes by coal, was evaporated by the same weight of peat in five to seven minutes. It will also be noticed that metal which required thirty-one minutes to be fused by coal, was fused by one sample of peat of the same weight as the coal in eleven minutes. The duration of the other samples of peat was one-third less than that of coal. The relative value of the fuels, taking into account the difference both in their duration and in the duty done by them (but irrespective of the difference in the time required for evaporation or fusion to commence, which is greatly in favour of the peat) are represented by the following figures, viz.:—

Coal, . . . . .	1·00	Peat, No. 3, . . . . .	1·33
Peat, No. 1, . . . . .	1·55	Peat, No. 4, . . . . .	1·55
Peat, No. 2, . . . . .	1·33	Peat, No. 5, . . . . .	2·80

The No. 5 sample of peat was in the proper condition for generating steam, or for smelting iron or other metals. The sample No. 1 was best suited for domestic fuel; Nos. 2, 3, and 4, were in the best state for the production of gaslight.

The above experiments were made by Messrs. Jackson and Johnson, operative chemists, 89, Bishopsgate-street, London. Valuable as this testimony is, it is only corroborative of the results obtained by Irish chemists.

There is another fact in connexion with peat which has been brought under our notice by a practical chemist, that there is in Connemara peat capable of being dried, for all practical purposes, to the same hardness as average condensed peat.

For gas, also, peat has been found most valuable. Mullingar gives a clear proof of this; so do several other places where peat has been adopted instead of coal. Peat has been ranked, on the best authority, in the following position for illuminating power, in reference to coal—viz., 1st, boghead coal, 4·35; 2nd, Lesmahago coal, 2·67; 3rd, peat, 1·90; 4th, Cannel coal; 1·75; 5th, Newcastle coal, 1·00. Boghead coal yields (per ton) 15,000 cubic feet of gas, of 37½ candle light; Lesmahago coal, 13,350 feet, 26 candle-light; Wigan coal, 11,420 feet, 20 candle light; Newcastle, 10,375 feet, 12½ candle-light; peat 11,000 feet, 22½ candle-light.

The above figures are the result of experiments made very lately. The charcoal of peat is also much more valuable than the coke of coal. Peat coke is more free from sulphur than that of coal. In the article of gas, the adoption of peat, for the sake of better gas, would be a very important matter in Ireland. As a whole, the people of this country have to burn a gas much inferior to that used in England—the gas used in Scotland being better than either. The high price of coal in Ireland might be some excuse, if there were no bogs; but so long as there is inferior gas in any town in Ireland, and the bogs are neglected, it must strike the least observant that there is inexcusable blame somewhere. Most of these facts have often been mentioned before. But at least one thing new, however, may be said on this subject—namely, that the notion, once so commonly entertained, that bogs ought to be used for other purposes than fuel, has now almost died out.

It is now required that capitalists should turn their attention to machines for compressing or condensing the peat. Works should be erected for that purpose, and tramways laid down to convey the fuel to market when

made. This is not a thing to be done by halves. Peat must be gone into extensively. None but large capitalists or joint stock companies are fit for such a work.

Peat bog is, probably, the only material of all the neglected resources of this country which can be worked as profitably (though it may not be so extensively), whether there are manufactures in the country or not. Fires must be had for every dwelling, which must be the chief source of demand at all times. Next to this, gas must also be had.

In the carrying out of any peat-fuel project, a market for its sale ought to be in every town, especially in Dublin. There it ought to be disposed of by sample on representation, as coals are now in London in the Coal Exchange. Manufacturers would find it necessary to sell in large lots to merchants, these to dealers, and dealers to retail vendors.

Some people talk about engineering difficulties in respect to Irish bogs. These resolve themselves into a question of capital. Others say that it would be better to drain the bogs and reclaim them, and let the peat alone. These cannot surely have made themselves acquainted either with the special character of Irish bogs or the value of peat, much less with the peculiar nature of those deposits so like Irish bog, which are now being drained at places in England (Chat Moss, for instance), and which deposits, not being worth the cost of economising the fuel, are utterly valueless, especially in a coal district.

10 GRIFFITH, Sir R. Bart.—(A) Geological map of Ireland, on a scale of four miles to an inch; (B) Section from the eastern to the western coast of Ireland, showing the succession of the Silurian, Devonian, and carboniferous rocks of the country; (C) Geological section, showing the unconformable succession of the primary and Silurian rocks of Connemara; (D) Section showing the coal series of the county of Antrim, resting unconformably on mica slate, succeeded by new red sandstone, lias, and chalk, surmounted by basaltic beds; (E) Section showing the geological structure of the south-east of Ireland; (F) Vertical section showing the tabular arrangement of the columnar and amorphous basalt, and intercalated beds of red lithomarga of the Causeway range of the north coast of Antrim; (G) Sectional view accurately representing the several columns, as well as general arrangement of the basaltic series, extending from the Giant's Causeway, for a distance of four miles, by the Loom and Organ to the Chimney-tops, and thence by Point Plaishin and Bengore Head as far as Dunseavrick Castle, looking southward; (H) Sectional view of granite veins traversing Hornblende syenite at Pass of Barnavave, near Carlingford Mountain, county of Louth; (I) Sectional views of M'Gillicuddy's Reeka, Killarney, showing the undulating schistose strata at their southern extension.—(North Corridor.)

Sir Richard Griffith's Geological map of Ireland, on a scale of four miles to an inch, was constructed during a period of forty-six years, having been commenced in the year 1809, and completed in the year 1855. This great work is unique in the history of such undertakings, as embodying the generalizations of a single geologist, who, at the early period above referred to, had no precedent, to guide him by comparison; and the value of his labours was recognized by the award of the Wollaston Palladium medal in the year 1854, on which occasion the late eminent Professor Edward Forbes, who was at that time President of the Geological Society of London, in a lengthened address, congratulated Sir Richard Griffith on the completion of a work of such magnitude and utility; at the same time expressing his individual admiration, not only of the originality of the author's views in classifying the peculiarities of an unexplored country, but of the minuteness of detail carried out, by personal verification, in "one of the most remarkable geological maps ever produced by a single person."

The copyright of this map is vested in the Lords Commissioners of Her Majesty's Treasury, by whom it was published. A reduction of the map, printed in colours, has also been prepared for the use of the Department of the General Survey and Valuation of Ireland, 23rd Vic., cap. 4.

The author was awarded a medal by the Jurors of the Dublin International Exhibition of 1865, as also by those of the Paris Exhibition for the year 1855.

The above sections were prepared in the order C, B, D, F, as illustrative of the geological map above-mentioned, with a view to show, by selections from representative districts of the country, the whole of the Irish series, whether sedimentary or igneous. Thus, section C embraces the lowest stratified rocks (? Cambrian) of Connemara, which consist of micaceous schists, quartzites, and primary limestones, with associated igneous rocks, lying at a high inclination, unconformably, beneath the fossiliferous Silurian strata of the Killary district in the County of Galway. Section B continues the succession from the Silurian rocks of the east coast of Ireland to the overlying and unconformable beds of the old red sandstone and carboniferous series, which consist of sandstones, shale, or schistose beds, sub-divisions of limestone and coal; this last being anthracitous in the midland and southern districts of the country. Section D completes the Irish sedimentary series, as seen in the county of Antrim, from the coal measures to the new red sandstone, lias and chalk rocks in ascending order; the last-mentioned formation being surmounted by the tabular basalt of the county (as observed at the Giant's Causeway), the subordinate beds of which are represented in section F.

821 PATENT PEAT COMPANY (LIMITED), 84 *Middle Abbey-st. Dublin.*—Compressed peat fuel.—(*Royal Dublin Society.*)

Mr. C. Hodgson, in a paper on the manufacture of compressed peat, read before the Society of Mechanical Engineers, stated that improvements on the ordinary mode of preparing peat fuel have attracted much attention for many years, the chief difficulty lying in drying the wet turf taken from the bog. A system which had in it all the elements of success was proposed by Groyneil and others about fifteen years ago. Their idea was to cut turf in the ordinary way, and to dry it to the extent possible during the Summer, then to grind it, and complete its desiccation whilst in a state of powder, and subsequently to compress it in a machine pointed with a reciprocating ram, and several moulds capable of being brought successively under the ram. A beautiful sample of hard fuel was thus obtained, but the quantity made was limited to samples, the machine being complicated. The practical difficulties which beset all early attempts in the manufacture of peat have now, however, been overcome by the system of machinery at present employed at the Derrylea Peat Works. The system in use at these works is based on the principle that the drying of the peat is the main difficulty of the manufacture; and this is accomplished by operating continually on the surfaces of disintegrated peat instead of on compact sods or blocks, and then using compression only as a means to render the already prepared peat transportable and marketable. The plan of obtaining the peat from the bog by successive harrowings and scrapings forms also a part of this system of drying by their surfaces. The apparatus in use at the works consist of a railway formed of thirty-six pound rails, well fished at the joints, running along the centre of the drained piece of bog. It is laid on sleepers of native timber, and carries an eight-ton locomotive. On these rails run a six-wheeled truck, across which, and marking the entire width of the drained ground, lies a square box lattice girder, which is formed of half inch angle iron at the corners, latticed on each of the four sides by one and a half inch by one quarter inch iron, with two feet spaces. It is six feet square at the centre, where it rests on the waggon, and tapers to one foot square at each end; and is assisted perpendicularly and laterally by wire rope

stays, set in taut. This apparatus is propelled by the locomotive at the rate of four miles an hour, with its great arms stretching over the bog at each side to the distance of nearly 150 feet; and to it are attached two harrows, each six feet square, which, by repeatedly passing over the ground, scarify the surface to a depth of from one to two inches. This operation is performed during any moderately fine weather, and in the mornings and during the day, the light powdered surface, which readily dries to a certain extent, is wheeled to the road by men and waggons into the works for manufacture. In dry weather the upper surface of the bog, thoroughly drained as it is, will always contain much less water, perhaps less than half what the general mass retains; and as by this mode of operation a fresh surface is being daily exposed, it follows that peat in the most favourable state for drying is being constantly operated on. As soon as the harrowing begins, rapid and continuous drying takes place, and a very large portion of the water, which is not removed by drainage, is evaporated by a few hours' exposure. The mull when waggoned into the factory is generally found to consist of about forty per cent. peat and sixty per cent. water. Bog in its natural state consists of ninety parts of water and ten of peat. When drained as described, after some hours of an average dry day, it consists of sixty parts water and forty peat. At Derrylea the only artificial heat used is that obtained from the waste steam of the compressing engines and the smoke and gases of the boiler fires.

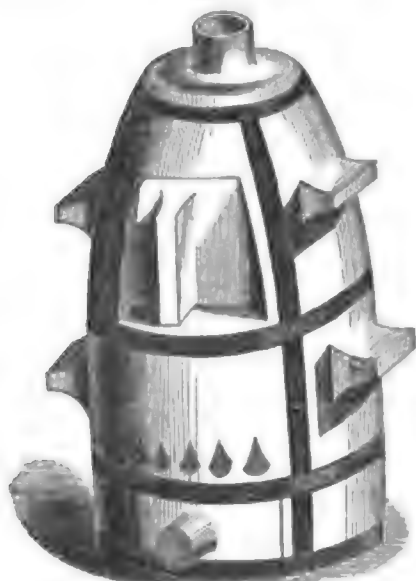
These are applied to heat very extensive surfaces formed of sheet iron, on which is spread a thin layer of peat mull, kept in continual and progressive motion by machinery. The drying kilns consist of brick buildings, 500 feet long by 30 feet wide, having an upper and under floor of one-eighth inch sheet-iron extending the entire length. The buildings are of brick, roofed with tiles. Under the lower floor, which is placed about two feet from the ground, is blown the smoke and waste heat of the boiler; and instead of the ordinary chimney a large fan is used to urge the fires, and force the products of combustion under this sheet-iron table.

The upper floor is carried on cast-iron girders, and stands four feet high above the lower one. It is made double, with a distance between the sheets, about four inches, for the purpose of being heated by waste steam from the compressing steam engine. By the time the whole of the sixty per cent. of water is evaporated, an arrangement of bands and elevators conveys the peat to a loft over the compressing machine, where it is subjected to the action of an apparatus, the result of which is to pass the peat down a tube by the action of a ram. As the peat is driven forward in the tube it becomes so wedged, and so powerful a resistance is offered by the friction against the sides of the tube, that each successive charge is consolidated into a separate hard block before the whole mass in the tube yields.

The outer end of the tube is entirely open, and the compressed peat is delivered from it in a continuous cylindrical bar, which can be readily broken up into separate discs of one inch thickness each, which are formed at each stroke of the ram. Each block in *transitu* remains one minute under pressure, and the quality of the compressed peat as fuel is further improved by its being made to pass along an open shoot, continued from the end of the tube, some 300 feet from the machine, to the store or waggon, without rupturing the continuous cylindrical bar in which the peat issues from the machine. Peat thus prepared, being so free from moisture, is well adapted for the boilers of stationary engines, and for brewer's work, and has found a ready sale for household purposes, its great cleanliness and freedom from smoke being a strong recommendation. A very good gas is made by using one third of Cannel coal and two thirds of this compressed peat; but it is probable that from its application to the manufacture of iron the most useful results will yet be derived.

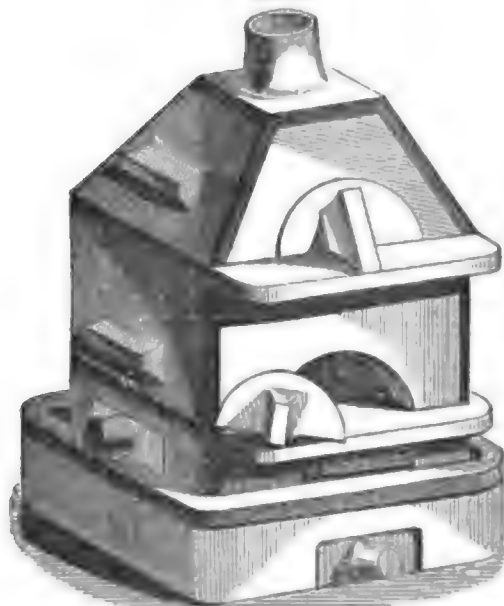
**822 PATENT PLUMBAGO CRUCIBLE COMPANY, Battersea Works, London, S.W.**—Crucibles for melting gold, silver, brass, copper, nickel, steel, and other metals; portable furnaces and other requisites for refiners, assayers, and dentists.—(*Agricultural Hall.*)

No. 1.



Portable Melting Furnace.

No. 2.



Muffle Furnace for Assayers, Dentists, Enamellers, &amp;c.

No. 3.



Muffle.

No. 4.



London Clay Crucible for refining Gold, &amp;c.

No. 5.

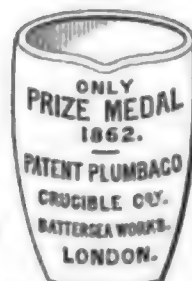


No. 6.



Scorifier.

No. 7.



Patent Plumbago Crucible, for melting Gold, Silver, Brass, Copper, Nickel, &c. These melt on an average 40 pourings, and are made of any shape and size, to hold from 1lb. to 1,000 lb.



Patent Plumbago Crucible, Cover, and Muffle, for melting Silver, as used in the various Royal Mints.

No. 8.



Patent Plumbago Crucible and Cover for melting Steel, Malleable Iron, &amp;c.

No. 9.



London Clay Crucible, round or triangular, for refining Gold, &amp;c.

No. 10.



Roasting Dish.

No. 11.



Skittle Pot for refining jeweller's sweep, &amp;c.

*Price Lists and Testimonials free on application to the works as above.*

**PRIZE MEDAL—SECT. 1 & 2.**

The Patent Plumbago Crucibles manufactured by this company have been in most successful use for many years, and are now used exclusively by the English, Australian, and Indian mints; the French, Russian, and other Continental mints; the royal arsenals of Woolwich, Brest, and Toulon, &c.; and have been adopted by most of the large engineers, brassfounders, and refiners in this country and abroad. Their great superiority consists in their capability of melting on an average 40 pourings of the most difficult metals, and a still greater number of those of an ordinary character, some of them having actually reached the extraordinary number of 96 meltings.

These crucibles never crack; become heated much more rapidly than any other description, and require only one annealing—may be used any number of times without further trouble, change of temperature having no effect on them. Mons. C. Dierick, master of the French mint, writes—“Each crucible runs from 40 to 60 pourings, and can with safety be dipped in cold water when at a red heat, and used again immediately, as if it had not undergone any change of temperature.” A large amount of time is daily saved at starting, other crucibles requiring to be annealed every morning before using, whilst these, although lasting a very considerable number of heats, only require to be annealed once; the metal is also fused much more rapidly, saving time, fuel, labour, waste, &c.; the saving also of metal is very great, as to each worn crucible there adheres a certain amount of metal—the commoner the crucible the greater the absorption and adhesion. In this respect, comparing the patent plumbago with the common crucible, the saving of metal and fuel is equivalent to the cost of the patent plumbago crucible.

The Company have recently introduced crucibles especially adapted for the following purposes, viz.:—**MALLEABLE IRON MELTING**, the average working of which has proved to be about seven days; **STEEL MELTING**, which are found to save nearly a ton and a half of fuel to every ton of steel fused; and for **ZINC MELTING**, lasting much longer than the ordinary iron pots, and saving the great loss which arises from mixture with iron.

Crucibles have been in use for melting and refining metals from that distant point of time when man exchanged his stone hatchet and bone chisel for implements of bronze. The earliest melting pots were doubtless made of the plastic and infusible substance clay, and there is no reason to suppose that they differed essentially from the earthen crucibles now commonly used in our foundries.

As an instrument of scientific research, the crucible has held an important position for at least a thousand years. It was constantly used by the first alchemists, and may, indeed, be truly styled the cradle of experimental chemistry.

At the present time, crucibles of one form or another are extensively employed by the refiner of gold and silver, the brassfounder, the melter of copper, zinc, and malleable iron, the manufacturer of cast steel, the assayer, and the practical chemist. They are made in many different shapes and sizes, and of many materials, according to the purposes for which they are intended. For certain chemical experiments, requiring high temperature, vessels of platinum, porcelain, and lime are adopted; but for ordinary metallurgical operations “clay crucibles” and “plumbago crucibles” are exclusively employed. We have now to confine our remarks to these two important classes of crucibles. On examining a clay or plumbago crucible it seems to be merely a rough specimen of pottery that might be easily imitated; yet the successful makers of crucibles are no few that they might almost be counted on the fingers of two hands. When we take into consideration the qualities which are required in a crucible to enable it to pass victoriously through the ordeal by fire, the paucity of good makers becomes intelligible. The crucible should resist a high temperature without fusing or

softening in a sensible degree. It should not be liable to break or crumble when grasped with the tongs, and it ought to be but little affected by the chemical action of the ashes of the fuel. Again, it may be required to withstand the corrosion and permeation of such matters as melted oxide of lead. In some cases crucibles should resist very sudden and great alternations of temperature, so that they may be plunged while cold into a furnace nearly white hot without cracking. In other cases they are merely required to resist a high temperature after having been gradually heated. Some crucibles are specially remarkable for one quality, and others for another, so that in selecting them the conditions to which they will be exposed must be kept in view.

The crucibles which present the finest combination of good qualities are those from which the Patent Plumbago Crucible Company takes its name. They support, even when of the largest size, the greatest and most sudden alternations of temperature without cracking; they can be used repeatedly, and their inner surface can be made so smooth that there is no fear of the particles of metal hanging about the sides. Their first cost is necessarily high, as plumbago is an expensive raw material; but the fact that they may be used for a great number of meltings makes them, in reality, cheaper than the ordinary clay pots. As fire-clay contracts considerably when exposed to a high temperature it cannot be used alone for large crucibles. The so called “clay crucibles” are made of a mixture of the plaster clay with some other substance, such as highly burnt fire-clay, silica, or coke, which counteracts in a measure the evil done to contraction, and so lessens the tendency of the vessels to crack. The large Stourbridge clay crucibles, so extensively employed by the brassfounders of Birmingham, contain both burnt clay and coke. The Cornish and Hessian crucibles are made of peculiar kinds of clay in admixture with sand. The great superiority of the plumbago crucibles over these can be easily accounted for by the fact that graphite or plumbago is the most incompressible of all substances known, and at the same time a material that can be thoroughly incorporated with the clay without impairing its plasticity. Some further particulars as to the process of manufacture of these crucibles will be found under the other exhibits of this Company, No. 37, Section II.

823 THE GOULADOO SLATE QUARRY, Bantry Bay, co. Cork (Lord Henry Loftus, owner).—Slates.—West Verandah.

The comparison of British and Irish building materials shows decidedly in favour of Irish. Wicklow abounds in granite. Some of this has been, and is now, sent to Scotland and also to England. But it might be made still more productive in a commercial sense. There are granites also in Carlow, and some in the county of Dublin. But the red granite of Galway much surpasses in commercial value all those which are dull and lustreless. These, however, are no less useful for building, and may yet be required largely for making breakwaters and docks in Irish bays and harbours. Both Mayo and Tyrone possess a little granite. Donegal has a great deal. Down abounds with the best granites, some kinds of which, to a small extent, are now worked at Newry, and may be more so when the railway is made via Rathfriland to Downpatrick, on the N.N.W. side of which town, extending a distance of two miles, there are several specimens of both red and grey granite. If any one wants red granite, however, it is actually easier to get it from Aberdeen than in any part of Ireland, even though the Irish specimens are better than the Scotch. The fact is that, some years ago, large quantities of granite were imported from Scotland to Dundrum Bay at a less cost than they could have been got in Ireland, simply because in the quarrying and trading of granite, skill, capital, industry, and enterprise are invested in Scotland, whilst none of all these are applied in Ireland, even though the granite would be more easily quarried, and quite as near to the seaboard as that of Scotland. Here is a field for

enterprise, and one on the cultivation of which money might be made at the rate of eight to ten per cent. But, bad as the granite case is, that of roofing slates is worse. In contravention of every principle of sound commerce, and to the loss of thousands of pounds per annum, the people of Ireland import slates from Wales, and allow their own quarries of Killaloe, on the Shannon, Valentia, near the seaboard; Glandore, county of Cork; and Ashford Bridge, Wicklow, to be comparatively neglected. These have never been worked deep enough. There is reason to believe that at like depths to which Welsh slates have been worked, Irish quarries would yield as good qualities as Welsh. Those already taken out, therefore, are not fair specimens. We do admit that the cheapest and best should always be purchased; but we do not admit that Irish slate quarries have yet got a fair trial. The demand has not been made for these slates to the extent to justify that outlay of capital necessary to reduce the cost of working to a minimum rate. But the fact is, the reason why the Welsh slates can be supplied cheaper than the Irish is that those who began to work the former did so on a scale to enable them to command a trade; and if Irish capitalists do likewise they will find that no Welsh slates can compete with Irish. In default of this extent of operation it would be more for the interests of commerce not to work Irish slates at all.—*W. G. Crory.*

**824 THE HOLYFORD COPPER MINING CO. (LIMITED),** 22, Nassau st., Dublin.—Copper ore from the newly-discovered lode in this mine, co. Tipperary.

**825 LOUGHREA SLATE QUARRY CO., near Killaloe.**—Slates.—(In West Verandah.)

**826 THE KILLALOE SLATE CO. (LIMITED).**—Slates. (West Verandah.)

**827 SMITH, W., 7 Lower Baggot st., Dublin.**—Coal ironstone, gypsum.

There are at present 73 collieries in Ireland, against 19 in 1853, which produced, in 1864, 70,000 tons of anthracite and small coal, and 55,000 tons of bituminous coal. The following is an enumeration.

#### ULSTER COAL FIELD.

##### COUNTY ANTRIM.

1. Ballycastle—Proprietor, — Boyd, Esq.—Working on a small scale.
2. Murlough Bay—Dr. Jno. M'Donnell. Not Working.

##### COUNTY TYRONE.

1. Annahone. Not Working.
2. Coal Island—Messrs. Staples and Caulfield, Not working.
3. Drumglass—Samuel Hughes, Esq. Working.

##### COUNTY CAVAN.

1. Kill—Messrs. Moore and Co. Not Working.

[This locality is remarkable, inasmuch as the coal (a sort of anthracite), lies in the rocks of the Lower Silurian period.]

#### CONNAUGHT COAL FIELD.

##### LOUGH ALLEN DISTRICT.—COUNTIES OF LEITRIM, SLIGO, AND ROSCOMMON.

1. Tullynaha—Proprietor, Patrick Buchan—Working.
2. Tullymurry " " "
3. Seltanskeagh " " "
4. Meenashammer—William Cronyn, "
5. Gobarruda—E. M'Dermott, "
6. Geevagh—Different colliers on their own account, "
7. Greagnageeragh " "

#### LEINSTER COAL FIELD.

##### CASTLECOMER DISTRICT—COUNTY OF KILKENNY.

1. Curragh—Hon. Mr. Wandesforde. Not working.
2. Massford, " " "
3. Coolbawn, " Working.
4. Rock, " " "
5. Monteen, " " "
6. Jarrow, " " "
7. Upper Riesk—Patrick Fenlon. " "
8. Broom Park, " Not working.
9. Crutt—Hon. Mr. Wandesforde. " "
10. Monala, " " "
11. Skehana, " Working.
12. Fiaroda—Freke. Not working.
13. Baurnafea—Lord Ormond, —
14. Coolcullen—Mr. Phillips, —

##### CARLOW AND QUEEN'S COUNTIES.

1. Bilboa—Horace Rochfort. Working.
2. Agharue—Sir T. Butler. Not working.
3. Ridge—Mr. Phillips, —

##### QUEEN'S COUNTY.

1. Wolf-hill—Coal Mining Company. Working.
2. Aufghamafn, " Not working.
3. Mullaghmore, " " "
4. Kingscote—Rev. Sir H. J. Walsh, Bart. " "
5. Modubee—Coal Mining Company. " "
6. Rushes—Rev. Sir H. J. Walsh, Bart. " "
7. Holly Park—Benjamin B. Edge. Working.
8. Meeragh, " Not working.
9. Geneva, " " "
10. Glen, " " "
11. Towlerton—William Edge. Working.
12. Kilgory—Benjamin B. Edge. Not Working.
13. Ardataggle—James Fitzmaurice. " "
14. Coorlaghan, " Working.

#### MUNSTER COAL FIELD.

##### SLIEVE ARDACH DISTRICT—COUNTY TIPPERARY.

1. Coalbrook—Mining Co. of Ireland. Working.
2. Boulea, " " "
3. Knockalonga, " " "
4. Earl's Hill, " " "
5. Ballynastick, " " "
6. Ballynahinneen, " Not working.
7. Mardyke, " " "
8. Coolquill, " " "
9. Glangoole, " Working.
10. Lickfinn, " " "
11. Garranacole, " " "
12. The Wood Colliery—Messrs. Beatty & Co., " "
13. Ballincurry—Mining Co. of Ireland. Not working.
14. Foylacamin—Messrs. Meadows & Co. " "
15. Knockinglaes, " Working.
16. Kilcooly—Mining Co. of Ireland. " "
17. Ballynulty, " " "
18. Manslat—Messrs. Meadows & Co. " "
19. Craigue, " " "

##### KANTURK DISTRICT—COUNTY OF CORK.

1. Dronagh—Nicholas P. Leader. Working.
2. Lisnacoon—Mining Co. of Ireland. " "
3. Drumskehy, " " "

##### LIMERICK DISTRICT.

1. Tulligoline—Lord Devon. Working.
2. Crataloe—Archdeacon Gould, " "
3. Sugarhill—Mansel, Not working.
4. Knockaboula—Lord Clare & Lord Monteagle, " "
5. Coalhill—Lord Clare, " "
6. Rockview—Lord Clare & — Slevin, Esq., " "
7. Glin—Knight of Glin, " "

*Iron Ores.*—The Scotch iron masters obtain ores from the North of Ireland in large quantities. The production in Ireland in 1864 was:—

	Tons	Value £
Ballymurtagh, brown hematite,	25,816	15,603
Ballycastle,	18,763	
Belfast exports, black band, &c.,	12,682	3,804
Londonderry,	3,341	919
	60,602	20,326

*Iron Pyrites* (Mundic and sulphur ores).—The following was the produce of the Wicklow mines in 1864:—

	Tons	Value £
Ballymurtagh,	29,500	15,978
Do. Coppery pyrites,	1,100	598
Ballygahan,	8,794	4,397
Cronebane and Tigrany,*	26,000	15,000
Connoree (estimated),	1,500	750
	66,894	36,721

### THE DUBLIN INTERNATIONAL EXHIBITION AND IRISH MINING INDUSTRY.

BY BREKENTON SYMONS.

AN exhibition of the industries of a country should ever be a most welcome and important epoch in its history; for probably nothing could be devised more calculated to give an impetus to commerce and manufactures. Here are seen the varied natural and artificial productions of such country, contrasted with those of foreign extraction, and any new machinery or improved manufacture can be easily adopted. Then there is the peculiar satisfaction consequent, should any particular work of art or piece of mechanism be found superior to those of foreign make, and the spirit of rivalry immediately evoked, should such seem to be of inferior design, or finished with less ability. That the spirit of competition is stimulated, and the resolve to improve generally, is completely demonstrated by the vast advance both in elegance and richness of design, with its necessary perfection of finish, and in the exceeding ingenuity of mechanisms, and their wonderful minuteness of construction, which has taken place since the Great International Exhibition of 1851. So completely has this advance in the industries of all nations remained unquestioned, that all Governments have recognised the value of encouraging such exhibitions; and so well and rapidly has the example of the first inaugural exhibition been followed, that similar and mostly successful ones have had place in almost every great capital in the world.

Although the Dublin Exhibition was far from being large, yet the general effect of the building, with the arrangement of articles exhibited, formed, especially when lit by gas, a *coup d'œil* elegant and pleasing in the extreme. Though there may not have been the surprise and wonder which were excited in the visitor on entering the London Exhibition, yet he was not so confused by the infinity of objects which met his gaze, and he left with a clearer appreciation of those objects of interest which he had seen. Indeed, the whole affair was well worked up, and conducted in a generally creditable manner. The large space occupied by Irish exhibitors showed their conviction of its importance, whilst the great beauty of many of their products proved them to be no mean competitors in the arts and manufactures.

It is not purposed in this brief paper to speak of the Exhibition as a whole, but merely to give some idea of the mineral wealth represented; and also to notice any mining machinery which may have been sent there for the inspection of those interested in this subject, and which may seem to be adapted to the more economical working of our mines, and this more especially with reference to the mineral capabilities of Ireland.

\* Against 14,446 tons in 1863.

It may be stated without fear of contradiction, that mineral products and mining machinery were by no means well represented; if this remark be applied generally, with still greater force may it refer to Ireland, which, being the *locale* of the Exhibition, should reasonably have had its minerals most clearly and completely illustrated. That the mineral productions of Ireland (well known to those conversant with the subject to be vast and inexhaustible) should be so miserably represented, and give such a faint idea of what the country is capable, is much to be deplored. It was desirable that those embarked in Irish mining should have bestowed some trouble to properly illustrate this most vital portion of the industry of the country, more particularly because the idea, erroneous though it be, is very generally entertained, that good mining properties are rarely to be found in Ireland.

One powerful cause of this want of faith in Irish mines is, the reckless manner in which many of the English companies have of late years been conducted. For instance, the promoters procure a lease for mining, without satisfactory assurance of its value, and often commence with a capital totally inadequate to properly develop it. To illustrate this, a case in the County Cork may be mentioned, where a mine was sunk to the eighty-fathom level, and thoroughly cross-cutted, with not a lode that deserved the name of a mineral vein; and yet this mine was worked for many years, at an outlay of thousands of pounds, without the slightest chance of being remunerative. Other mines, which have been speculations of great promise, have languished from inadequate means.

This so far as relates to the operations and adventures of English capitalists. The Irish companies, though not all successful—more especially in former years, when the causes above adverted to operated strongly also against them—yet show a large, if not a much larger measure of success than can be ascribed to the most favourable of English districts. We may mention particularly the mines and collieries belonging to the Mining Company of Ireland, whose works are various, extensive, and are all most successfully conducted. Again, no mines have had a more brilliant career than the Wicklow Sulphur and Copper mines, which have been profitably worked for the past 100 years, and still continue in full operation, shipping weekly the enormous quantity of 3,000 tons, of which Ballymurtagh mine alone returns 1,500.

These mines are extensive, and will continue their returns unabated for years to come without being exhausted.

The celebrated Berhaven mines are so well known, that it is almost superfluous to state, that the mines give a profit to their owner, Mr. Puxley, of between £30,000 and £40,000 per annum. Many others might be instanced, and would conclusively prove that it is not of the want of mineral riches that the people of Ireland have to complain, but the lack of energy, capital, and proper selection.

To return, however, to our subject; it was observed that the Exhibition, as far as the mining industry of the country was concerned, might be considered a failure; for, if we except a beautiful and carefully prepared case from the Mining Company of Ireland, and a case of very fine and rich specimens of copper ore from Holyford, there was scarcely anything to show what the mineral productions of the country were. It might have been expected, for instance, that a case of barytes, showing its preparations and uses, would have been forthcoming, as it has been somewhat extensively raised. A case from the County Cork, exhibiting its well-known beautifully varied and rich ores, would have been a great attraction; and, above all, there should have been seen somewhat more of the value of the collieries, with a well assorted collection of specimens of the associated strata. The disappointment was somewhat general, that greater prominence and space were not bestowed upon what all who understood the subject considered a great point, to which Irish industry should for the future largely tend.

That a great and important portion of British capital is destined to find its employment on Irish soil, when the present senseless prejudice dies out, is well believed; we therefore beg to draw attention to the objects that were exhibited, and to observe that they were but sorry samples of the really intrinsic value of the mines of Ireland.

It will scarcely be credited, but it is, nevertheless, the fact, that some mining companies positively refused their agents the gratification of displaying specimens of their produce, because the carriage thereof would have cost a few shillings, and such a show might induce a false idea of their mines' value?

The *Mining Company of Ireland* are entitled to great commendation for the very superior manner in which they presented to the inspection of visitors a case containing illustrations of the various processes by which they transform the copper and lead ores, as raised from the earth, into merchantable products; another set of samples clearly showed the various stages by which dressed lead ore is changed by smelting into numerous commercial articles, viz., litharge, red lead, sheet and tube lead, shot of all sizes, &c. A large cake of pure silver, extracted from the lead by Pattison's process, weighing 7,514 ozs., of the value of £2,000, attracted much attention. A large piece of coal, apparently the width of the seam, 2 feet 8 inches wide, must convince the beholder that good coal is no stranger to the Emerald Isle. There was also a very creditable collection of beautiful specimens found associated with copper and lead ores. Altogether, the case afforded a pleasing and attractive exhibition of the Company's operations.

The *Connoree Mining Company* showed a case of minerals from their copper and sulphur mines in Wicklow.

The *General Mining Company for Ireland* had an interesting case, containing specimens of calamine ores, showing their mode of dressing and rendering it marketable. The existence of these calamine works is little known; still less so is the fact that they are the only calamine mines in the United Kingdom, with the exception of a few in Wales and Somersetshire.

In the west verandah there were some specimens of the slates from the Rosmore, Gouladoo, Loughrea, and Killaloe quarries.

The *Marine Salts Company of Ireland* exhibited a case containing specimens of the salts obtained from seaweed at their works in Galway; the quality appeared to be of somewhat superior percentage.

We now proceed to notice what was done by other countries, commencing with the Colonial Department. Canada exhibited a good and complete collection of her productions, contributed principally by the Government authorities. A very splendid and well selected assortment of minerals attested the value of the mines and quarries of that colony; some of the building stones were fine, and well adapted to decorative architecture. There were some magnificent specimens of copper, lead, &c., the amythestine quartz was particularly beautiful; one hexagonal pillar of apatite measured three feet long, and contained ninety per cent. of phosphate of lime.

It is to be regretted that more space was not accorded to those minerals, as they were much crowded, and occupied positions in the last degree irksome to study them.

From *Nova Scotia*, amongst other minerals, was a large mass of beautifully crystallized manganese. The vast thickness of its coalfield was well illustrated by a column of coal in the garden, thirty six feet in height, representing the thickness of the Pictou seam, believed to be the thickest hitherto discovered in the world.

Amongst the articles exhibited from Victoria was a gilt model of the celebrated "Welcome Nugget," the largest ever discovered. This was found at Ballarat, in 1858; its value was £8,376 10s.

The usual pyramid, showing the bulk of gold raised in Victoria, had of course a place here. This demonstrated the bulk of gold raised in the colony from

October, 1851, to the same date, 1861, at 1492:50 cubic feet. This was estimated at 800 tons, and was of the value of £104,649,728; since then to the end of 1864 gold has been procured to the value of £29,211,980; or altogether from Victoria alone has been obtained £134,000,000 money value.

Italy sent specimens of most of her minerals. Amongst beautiful examples of serpentine and marble, were also seen some of lignite, sulphur, and steel, with ores of copper, lead, nickel, gold, salt, and manganese.

By far the most interesting, however, was a series illustrative of the various descriptions of rocks found in boring the Mount Cenis Tunnel through the Alps. These were taken at equal distances of 200 metres on each side of the mountain, and afford valuable information with regard to the geological formation of these mountains, which form a natural barrier between France and the fertile plains of Italy.

The *Zollverein*, as becomes her recognised value as a mining field, sent a neat and complete suite of minerals of a most interesting and instructive nature, accompanied by geological maps and sections, which illustrate and explain the formations in which are found the mineral veins and deposits. It should be noticed that the minerals exhibited, though they were only small in quantity, yet possessed considerable interest.

Mining machinery was, with three exceptions, unrepresented; these were, however, sufficiently interesting. One most especially—a slate-dressing machine, recently patented by Amos and Francis—deserves particular mention, both for its extreme simplicity of design, and its complete and admirable adaptation to the work it has to perform. So easily does the little "treadle"-worked machine fulfil its office, that it has been proved superior to the "power" machine, both in speed and in the amount and application of the force employed.

The result of a trial of the two machines was this: the "power" machine in twenty-five minutes finished 179 slates of various sizes, having a total superficial area of 286 feet; the "sword arm" machine, as it has been appropriately termed, completed, in the same time, 207 slates, with a surface area of 358 feet.

The person who had charge of the machine in the building, finished with it fourteen marketable slates within the minute; but this is confessedly more than could be kept up during a regular day's work.

This machine, also, it must be remembered, does away in toto with the trouble of squaring and measuring, as by the usual process, and insures perfect truth of rectangularity and size. Sixty of these invaluable machines are in constant operation at Bangor, where they are much liked, and used with great success.

By the side of this machine was a large power machine, for cutting blocks and slabs of slate.

In the department of Machinery in Motion, was one of Blake's stone-breakers, or ore crushing machines, which appeared to do its work easily and well, and is certainly far preferable to the "spalling" now in vogue. It is also intended to be employed in making road stone; it would seem, however, to us to reduce too large a proportion into "smalls."

With regard to the exhibition of minerals as affecting Ireland, it gave the spectator no means of judging of the capabilities which the country possesses for the production of minerals; no one would suppose that some of the largest metallic mining establishments of the United Kingdom exist in this island; and those, be it known which return the largest quantities of ores.

As Irish mines have been of late so generally and so persistently decried, it would be but proper to notice one of the causes, if indeed it is not the sole cause, of the present lack of energy visible in the mining interest. It may be stated boldly that it is the want of an active interest taken by the gentry, especially by the commercial men and merchants of the country, in the progress of their mines; or, if they seem to take an interest—as there are some who do—it is, unfortunately, without sufficient faith in its success to embark any large

amount of capital in their development. That there are some Irish capitalists who do invest largely in their mines is unquestionable; but they are, it is to be regretted, few, very few, compared with the numerous class who should do so.

It is really amazing to the professional traveller that so many extensive and valuable tracts of mineral ground, presenting such unmistakable geological features with mineral indications of such a promising character, should be permitted to remain untried for their mineral wealth—unknown, and uncared for.

More strange is it, and the more to be regretted, that mining should be so neglected here, because the spirit of mining industry is widely spread throughout the world, is in fact rapidly extending, and becoming a recognised commercial business; thus, those means that should and could be employed with much better results at home, if the capitalists of Ireland would but bestir themselves to start their own mines, are being diverted from their legitimate channels, by the busy rivalry of miners in other countries.

It is absolutely necessary—indeed, is of vital importance to the successful opening and existence of mining districts—that local shareholders should largely and generally invest some capital in their mines; without this, it will be impossible to get other capital extensively and permanently invested.

It gives confidence to the out adventurer,\* when he sees a good body of local shareholders; as it attests their belief in the value of the mines, and gives confidence that their affairs will be efficiently and economically managed.

#### JURY FOR CLASS A.—RAW MATERIALS.

THOMAS ANDREWS, M.D., F.R.S., Professor of Chemistry, Queen's College,	Belfast.
J. APJOHN, M.D., F.R.S., Professor of Chemistry, University of	Dublin.
CHARLES BOISSEVAIN, Commissioner for the Netherlands,	Holland.
BRUNO BRESLAUER, Commissioner for Austria,	Austria.
C. A. CAMERON, M.D., M.R.I.A., Analyst to the City of	Dublin.
CORR-VANDERMAEREN, Commissioner for Belgium,	Brussels.
R. GALLOWAY, F.C.S., Professor of Practical Chemistry, Museum of Irish Industry,	Dublin.
ALPHONSE GAGES, Curator of the Museum of Irish Industry, Dublin,	France.
Capt. HENRY,	Dublin.
J. B. JUKES, M.A., F.R.S., Director of the Geological Survey of Ireland,	Dublin.
G. LUNGE, Ph. D., Chemical Manufacturer,	Zollverein.
E. D. MAPOTHER, M.D., Surgeon to St. Vincent's Hospital,	Dublin.
AUG. C. MARANI, Italian Consul in Dublin,	Italy.
C. F. MOORE, M.D., L.R.C.S.I., L.M.,	Dublin.
Sir PERCY NUGENT, Bart.,	Dublin.
G. SCOTT, Wine Merchant,	Dublin.
R. D. SCOTT, Woollen Manufacturer,	Dublin.
G. H. SCRIVENOR, Officer of H. M. C. to the Exhibition,	London.
C. SIBTHORPE, Wine Merchant,	Dublin.
P. L. SIMMONDS, Superintendent of the Colonial Department,	London.
MAXWELL SIMPSON, M.B., F.R.S.,	Dublin.
W. SULLIVAN, Ph. D., M.R.I.A., Prof. of Chemistry, Museum of Irish Industry,	Dublin.
CH. R. C. TICHEBORNE, F.C.S.,	Dublin.
J. WILSON, F.R.S.E., Prof. of Agriculture, University of Edinburgh,	Edinburgh.

\* A term amongst mining men for a non-resident adventurer.

#### LIST OF AWARDS. MEDAL.

##### UNITED KINGDOM.

6 MINING COMPANY OF IRELAND, 30 Lower Ormond quay, Dublin.—For a carefully selected collection of Irish ores and minerals, and skill in the processes of extraction, and for articles manufactured at the company's works, Ballycorus.

10 GRIFFITH, Sir R. Bart. 2 Fitzwilliam place, Dublin.—For his geological map of Ireland, and elaborate sections and geological drawings of various parts of Ireland.

821 PATENT PLUMBAGO CRUCIBLE COMPANY, Battersea Works, London, S.W.—For excellence of its productions in Section I. Also for different varieties of plumbago, natural and in the manufactured state, in Section II.

826 KILLALOE SLATE COMPANY, Co. Clare.—For excellence and size of slates.

825 LOUGHTEE SLATE COMPANY, near Killaloe.—For excellence and size of slates.

##### CANADA.

1 CROWN LANDS DEPARTMENT OF CANADA.—For an interesting series of ores and minerals.

2 BOARD OF ARTS OF CANADA, Montreal.—For part of an excellent collection, prepared by the Officers of the Geological Survey of Canada, and illustrating the mineral resources of the district surveyed.

##### NOVA SCOTIA.

35 HONEYMAN, Dr.—For specimens of fossils, sketch-maps, and sections, giving valuable geological information.

37 HOW, Dr.—For a complete collection of the minerals of the colony.

39 JONES, T.—For good pig iron and iron bars, &c., obtained from hematite, found in the locality.

60 SCOTT, GEORGE.—For his column of coal, giving a section of the main seam at the Albion mines, 35 feet 6 inches thick.

68 WAVERLEY GERMAN GOLD MINING COMPANY.—For a very interesting collection of auriferous quartz, and of gold produced from it.

##### VICTORIA.

22 LATHAM & WATSON, Sandhurst.—For a well selected and instructive collection of auriferous quartz, &c.

127 LIGAR, C. W. Surveyor-General of Victoria.—For maps of Victoria gold fields, obtained by the photolithographic process of W. Osborne.

129 SELWYN, A. R. C. Government Geologist.—For his most admirable and valuable geological maps of parts of the Colony.

##### BELGIUM.

1 AMAND, A. Bourignes, near Dinant, Prov. of Namur.—For excellence of quality of his charcoal iron.

2 AMAND, E. Mettet, Prov. of Namur.—For excellence of quality of charcoal iron, used chiefly for gun barrels and edge tools.

3 BLONDIAUX & Co. Thy-le-Château, Prov. of Namur.—For iron of excellent quality.

5 COUPERY DE ST. GEORGES, E. Dinant, Prov. of Namur.—For an excellent collection of polished marble slabs, sold at a very low price.

6 DASSONVILLE DE ST. HUBERT, L. Namur.—For the excellent quality of his mill stones (in chert breccia).

**8 SOCIÉTÉ DES FORGES DE ZONE, Marchienne-au-Pont, near Charleroi.**—For fine specimens of wrought iron and rolled sheet iron, with fine surface.

**9 SOCIÉTÉ ANONYME DES HAUTS FOURNEAUX ET LAMINOIRS, Montigny-sur-Sambre, near Charleroi.**—For steel castings, and wrought-iron of excellent quality.

### FRANCE.

**3 ROGER, SON, & Co. La Ferté sous Jouarre.**—For their excellent mill-stones.

**4 SOCIÉTÉ DES ARDOISIÈRES DE LA RICHELLE, Rimogne, Ardennes.**—For slates of good quality, and skill in their manufacture.

### ITALY.

**1 BARBAGALLO, SALVATORE, Catania.**—For excellent quality of sulphur.

**3 DIRECTORS OF THE MONT CENIS TUNNEL THROUGH THE ALPS, Turin.**—For the collection of rocks met with in piercing the tunnel, and as a mark of the interest felt in the success of the great undertaking of the Company.

**11 ROMAGNA SULPHUR MINES, Bologna.**—For excellence and skill in manufacture.

**14 SANTINI, AVV. GIUSEPPE, Seravezza (Lucca).**—For specimens of Seravezza marble.

### ROME.

**1 PONZI, Prof. G.**—For an interesting series of rocks and minerals, illustrative of the geology of the neighbourhood of Rome, and also for a well-executed geological map of the Tolfa mountains.

**5 ROSSI, Cav. M. S. De.**—For his interesting plan of the subterranean cemetery of Callixtus, with geological sections.

### ZOLLVEREIN.

**1 MINING CO. SICILIA, AND COUNT OF LANDSBERG VELEN, Alten Hunden, an der Lenne, Westphalia.**—For exhibition of large masses of iron pyrites of a very superior quality.

**2 BOERNER, MARTIN, Siegen, Westphalia.**—For rich and fine specimens of carbonate of iron, copper, and lead ores.

**4 MEURER, W. Cologne, R. P.**—For iron ore and fine specimens of Bessemer's steel.

**5 DINNENDAHLE, R. W. Huttrop, near Steele, R. P.**—For an effective centrifugal ventilator.

**6 D'ABLAIR, J. TROBERG AND DE WILDT, Hermannshütte, Neuwied, R. P.**—For iron ore and steel of superior quality.

**11 BOCHUMER IRON FOUNDRIES, Bochum, Westphalia.**—For a simple and effective hand ventilator.

**12 GOVERNMENT BOARD OF MINES, Bonn, R. P.**—For the admirable atlas of geological maps of the Prussian States, by Herr von Dechen.

**13 GOVERNMENT BOARD OF MINES, Dortmund, Westphalia.**—For a most valuable series of maps and sections of the mining district of Westphalia.

**13A SOCIETY FOR THE PROMOTION OF MINING INTERESTS, Essen.**—For an interesting selection of minerals, ores, coals, mining models, &c., illustrating the geology and the mineral resources of Westphalia.

**14 GOVERNMENT BOARD OF MINES, Halle, Prussian Saxony.**—For the well executed and valuable maps and sections of the provinces of Saxony and Brandenburg.

**15 GOVERNMENT BOARD OF MINES, Breslau.**—Geological maps of the provinces of Silesia, remarkable for execution and completeness.

### HONOURABLE MENTION.

### UNITED KINGDOM.

**1 AUSTINE & Co. 20 Dixon st. Glasgow.**—For fine block of coal.

**3 CONNOBBEE MINING Co. Orocra, Co. Wicklow.**—For fine collection of sulphur and copper ores, precipitate of copper, &c.

**4 GENERAL MINING CO. FOR IRELAND, 29 Westmoreland st. Dublin.**—Specially for fine specimens of Calamine.

**5 LISABE, F. C.E. 19 Westmoreland st. Dublin.**—For slabs and flags from Gooladoo quarry, Co. Cork.

**11 PATENT PEAT Co. 84 Middle Abbey st. Dublin.**—For compressed peat.

**7 BANDON, Earl of, Currikkibue.**—Good specimens of carboniferous slate from the works of the Rossmore Slate Co.

**824 HOLTFORD MINING Co. 22 Nassau st. Dublin.**—Large specimens of copper ore.

### INDIA.

**INDIA MUSEUM, Whitehall yard, London.**—For a well-selected collection of minerals.

### NOVA SCOTIA.

**1 ARCHIBALD, HON. T. D.**—For good samples of coal.

**8 BROWN R.**—For interesting specimens of coal.

**10 CAMPBELL, C. J.**—For good specimens of coal.

**28 GOVERNMENT.**—For an interesting collection of gold nuggets.

**41 LANG, G.**—For a well-selected series of good building stones.

**55 NASH, J. D.**—For large mass of pyrolusite.

**63 SYMONDS, KAT, & ROSS.**—For good specimens of coal.

### VICTORIA.

**5 BANK OF AUSTRALASIA.**—For their fine series of samples of gold.

**6 UNION BANK OF AUSTRALIA.**—For their samples of Victoria and New Zealand gold.

**7 AMOS, ROBERT.**—Carron Rolling Mills, Melbourne.—For exhibition of iron of excellent quality.

**8 BARNARD, W. Beechworth.**—For specimens of stream tin and smelted tin from Reid's Creek.

**9 BLAND, R. H. Clunes.**—For auriferous quartz, from the Clunes Mining Company.

**12 CLARKE, W. JUN.**—For specimens of silver ores.

**14 DERMOTT, MESSRS. St. Kilda.**—For specimens of gold and auriferous quartz.

**15 GIBBS, R. R. Ballaarat.**—For exhibition of specimens of gold and auriferous quartz.

**20 KNIGHT, J. G. Melbourne.**—For an interesting collection of building stones.

**21 LANG & Co. Melbourne.**—For exhibition of various limestones.

**23 LATROBE TIN MINING COMPANY.**—For exhibition of tin ores.

**25 MACILWRAITH, J. & Co. Melbourne Lead Works.**—For manufactured sheet lead and lead pipes.

**28 O'MALLEY, M. Ballaarat.**—For exhibition of auriferous ores.

**29 STRONG.**—For fine specimens of antimony ores.

### BELGIUM.

**4 BRINCOURT, L.**—Herbeumont, Prov. of Luxembourg.—For good quality of slate, &c.

**7 MULLER & Co. Engis, Prov. of Liège.**—For excellence of his products.

**11 VERBIST-LAMAL, R. Brussels.**—For his collection of black marble.

**12 WATRISSE, L. Dinant.**—For specimens of black and blue marble.

## ITALY.

**5 LANCIA, F. DUKE OF BROLO, Palermo.**—For exhibition of sulphur, crystallized sulphur, and interesting minerals.

**6 MASCOLO, G. Ponte della Maddalena, Naples.**—For fine specimens of steel.

**7 MORET, PEDRONE, & Co. 11 Via di Brera, Milan, and Lecco (Como).**—For collections of copper, nickel, and lead ores.

**8 NOVI, Prof. GIUSEPPE, 84 Margellina, Naples.**—For his industrial mineral collection.

**15 SARDINIAN SALT WORKS COMPANY, Genoa.**—For fine collection of table salt.

**18 LENTINI, ROSARIO, Palermo.**—For exhibition of bituminous marl, sulphur, and manganese.

## ROME.

**2 MAMI, COUNTESS ANGELA.**—For exhibition of rock sulphur and refined sulphur from Solfatara, at Canale.

**3 ROMAN COMPANY OF IRON MINES AND IRON MANUFACTORIES.**—For good specimens of iron and collection of ores.

**4 MARTIMORI, PIETRO.**—For the beauty of the materials worked by him.

## ZOLLVEREIN.

**3 DUEKER, BARON VON.**—*Ernsthausen, near Bochum, Westphalia.*—For geognostical outlines and profiles.

**7 ROCHOLL, BROTHERS, Remscheid, R.P.**—For excellent exhibition of manganese ores.

**8 HILF, MAY, & Co. Limburg, Nassau.**—For fine collection of manganese and iron ores.

## SECTION II.—CHEMICAL AND PHARMACEUTICAL PROCESSES, AND PRODUCTS GENERALLY.

*Report on the Chemical Products shown at the Dublin Exhibition.*

By CHAS. R. C. TICHBORNE, F.C.S., F.R.G.S.I., &c.\*

Like all Irish Exhibitions, the present is more of an art exhibition than one of raw materials and machinery. The fine arts proper—viz., sculpture, painting, and photography, are well represented, and decorative art as applied to textile fabrics, metallic and pottery manufactures are there in abundance; but there is a falling off from the exhibitions of Great Britain as regards the raw materials, therefore the chemical reporter has not the work before him which he had premeditated before the memorable 9th of May when the gate “op’d his ponderous and marble jaws” to the curious and expectant crowd; but there is still enough to interest and instruct even in our own strict department. Many new phases have cropped out through the instrumentality of our own splendid science since the Exhibition of 1862. Although only two or three years have elapsed, science has been going at an electric pace, and the accessories must keep up with the rush. In the words of the author of that masterpiece of reports,† “Progress, rapid and important in all branches of art and manufactures—such, broadly and briefly stated, is the gratifying result, elicited by a general comparison. Everywhere his eye will be met by proofs of the all-pervading influence of chemistry in the development of the arts; everywhere he will see new materials elementary or compound, placed by chemistry at the artificer’s disposal; finer and more delicate results of all kinds achieved by aid of the knowledge due to chemical investigation.”

*Precious Metals, &c., British Department.*—Perhaps one of the most interesting cases in the Exhibition is Messrs. Johnson, Matthey, and Company’s case of precious metals. For although it may contain nothing of absolute novelty, the very rare and beautiful specimens must elicit a certain amount of admiration even from those who are not acquainted with the difficulty which is experienced in procuring such substances as are here exhibited. The principal things in this case are platinum boilers, alembics, syphons, tubing, and capsules, &c., which are soldered by what Messrs. Johnson and Co. call the patent autogenous process—this euphonious name expresses, as we suppose, the fusing of the platinum seams together, by which the use of gold is avoided. A boiler for the rectification of sulphuric acid is exhibited, valued at £1,500, and capable of rectifying to the full strength three tons of sulphuric acid per day. The firm makes boilers with all the recent improvements capable of concentrating from half a ton to ten tons of acid per day.

*Apropos* of platinum sulphuric acid stills, there can be no doubt that the large manufacturers of sulphuric acid are reverting back to the old plan of concentrating in glass. The great wear and tear produced upon the platinum by the sulphuric acid (especially when containing nitrogenous products), combined with the interest of capital sunk, have induced the manufacturers to return to their old material. Dr. Hofmann, in his Exhibition Report, refers to this fact, but mentions at the same time that the platinum still seems to hold its ground in France. The writer

\* From the *Chemical News* London.

† Hofmann’s Report upon the Exhibition of 1862, Section A, Chemical Products and Processes.

of the present report paid a visit last Winter to one of the largest sulphuric acid manufacturers in England, and found that he had completely discarded the platinum. The great disadvantage occurring from the frequent breakage of the glass has been in a great measure overcome by the judicious choice of glass suited to the purpose, a careful tempering of the alembics after they are made, and the exclusion of the exposed parts of the vessels, when working, from currents of cold air. The alembics are generally placed in rows on each side of a long chamber, and the number of fires naturally conduce towards an atmosphere the temperature of which is a guarantee against unequal expansion, provided nothing comes in actual contact with the glass. The retorts are worked continuously, being filled with hot acid.

M. Scheurer-Kestner says that in an apparatus producing 4,000 kilogrammes 1,000 kilogrammes were found to dissolve, and to carry off two grammes of platinum; when the sulphuric acid contains nitrous vapours, this quantity was increased to four or five grammes. But according to M. Kestner the alloy of platinum and iridium is comparatively unacted upon by boiling sulphuric acid.\*

Messrs. J. and M. show a specimen of this alloy, but we are not aware that any practical attempts have been made towards its use in the construction of sulphuric acid stills. An alloy of this metal and osmium is also shown, which is used for pen points.

Since this report was first published we have received a letter from Messrs. Johnson and Matthey, in which they repudiate the idea that the manufacturers are returning to the glass. We are very glad to learn this, as no doubt can be entertained of the superiority of the metal in many respects. The writer is also in a degree pleased that he has been the means of bringing forward a contradiction to statements and impressions which had certainly taken hold of the chemical public.

The writer is not a manufacturer of sulphuric acid himself, and therefore can only judge of the facts that come within his observation. We have the following passages occurring in Dr. Hofmann's important chemical report, a report written upon the largest Exhibition ever held in Europe:—"Nevertheless the platinum alembics have disappeared from many of the British sulphuric acid works, and the manufacturers are returning to the old method of evaporating in glass." Again, "In Lancashire the use of platinum retorts has been entirely abandoned." These facts in connexion with a visit made by the writer to one of the largest manufacturers in the kingdom (not in Lancashire), who had also given them up, were quite sufficient to justify his remarks. Against them we have a case where a manufacturer has returned a second time to the platinum. There can be no doubt that where the advantages and disadvantages are anything like equally balanced, fashion creeps in even in hard matter-of-fact practical processes, and this may account why, in Messrs. Johnson and Matthey's opinion, a retrograde movement has taken place to a certain extent; and we are inclined to think with them that it is a retrograde movement. Of so much importance does the writer consider the subject (for sulphuric acid may be viewed as the progenitor of chemical products), that, having received Messrs. Johnson and Matthey's permission, a few extracts from their note are given:—

"We would, however, ask you to modify your views as regards the platinum system for concentrating sulphuric acid, assuring you that the statements made are essentially contrary to fact. We have never for forty years past been so much engaged in the manufacturing of platinum boilers as we have been lately. This is practically the strongest evidence of the advantage of the platinum over the glass system. . . . At the present moment we can instance a manufacturer who originally worked with platinum, and was induced to give it up in favour of glass, and after incurring the expense of the sacrifice of the platinum plant, and that of setting up the numerous furnaces required for glass working, has lately taken down the whole of the latter, and is again using the platinum, assuring us that the saving in fuel alone very greatly exceeds the interest, &c., of the platinum plant. . . . We can go further than this, and state upon well-proved statistics that the saving in fuel and working expenses and space, will in five years pay in full for the cost of platinum vessels; after which time not only is there the extreme profit over the glass system, but an intrinsic value in the plant. Also there is the advantage of great rapidity and certainty in working, and above all, of absolute safety to the workmen employed. . . . It may interest you to know that a committee of the directors of some of the Continental manufactories lately visited England for the express purpose of reporting upon the two systems, and after a thorough investigation, although they came with a strong prejudice in favour of glass, they have unanimously reported in favour of the platinum system. . . . We

\* Two capsules—one of platinum and the second of platinum-iridium alloy—were introduced into a platinum alembic, and exposed for two months to the action of boiling sulphuric acid. The capsule of pure platinum was entirely deformed, and its surface corroded. It had lost not less than 19·68 per cent. of its weight. This capsule of iridio platinum, on the other hand, was found to have retained its form; the surface had remained brilliant, and the loss did not amount to more than 8·88 per cent. of its weight. The loss of the second capsule is accordingly not more than 45 per cent. of the loss of the pure platinum vessel.

should be sorry for an erroneous opinion to be promulgated on this subject, although this may be considered as an interested statement on our part."

There are exhibited also in Messrs. Johnson, Matthey and Co's. case, specimens of platinum gauze, which, we may suggest, might find some uses in connection with chemical gas burners, and would be also applicable to laying under the combustion tube in an organic analysis.

The same firm likewise exhibited copper vessels plated with platinum, which are worthy of a more extended application for chemical purposes.

A model of the ingot of pure platinum was shown, "melted by the intense heat of combined gases." Weight, 3,200 ounces; value, £3,840. Palladium and some of its salts are here exhibited. We may mention that this metal seems to have now become extremely rare, probably from the fact that the native platinum now worked in this country does not contain much palladium. Splendid crystals of chloroplatinate of sodium are exhibited; some of them more than an inch in length.

Bismuth is represented by a fine iridescent specimen composed of distinct crystals.

The specimens of trichloride of gold exhibited by this firm are very fine, and are worthy of a special notice. The salt as exhibited by Messrs. Johnson and Matthey is of a bright orange colour, and in distinct needles, perfectly dry. The mode in which this appearance is procured is by one of those simple trade manipulations which, although not mentioned in books, are often of the utmost importance as regards the appearance of the manufactured article. From the ready solubility of trichloride and its deliquescent nature, it is necessary to evaporate the solution until it will set into a dark-red and crystalline mass on cooling. But by allowing the solution to cool slowly to a point somewhat short of its actual solidification, and then pouring off from the crystals already formed the still fluid portion, a mass is procured of the most brilliant colours, and consisting of a net-work of distinct prisms. The product procured in this manner is less hygroscopic than the ordinary salt.

The specimens of nitrate of silver and lunar caustic are excellent, and we have samples of what is called triple crystallized nitrate for photographic purposes. The product is certainly very pure and neutral; so exactly neutral is it, that the writer has observed that most of the distilled water, as sold, gives a decided opalescence with this salt—particularly if the water has been distilled some time, and contains in consequence any microscopic vegetation. They also show a platinum pyrometer (patent) described as a "novel application of the spiral coil of a compound lamina of two metals of unequal expansion by heat."

But perhaps the most interesting in a scientific point of view are a few rare metals and non-metallic elements which are here. These include two magnificent specimens of graphitoidal boron and silicium, the latter forming a very beautiful object. Iridium, rhodium, osmium, ruthenium, tellurium, selenium, caesium, and rubidium.

Pitch blende, uranium, and its pretty greenish-yellow salts are also exhibited. The patent sunlight, magnesium, is also here in great force, but the reader is now so conversant with its properties that it is needless to dwell upon the subject.

Messrs. Bell, Brothers, of Newcastle-upon-Tyne. exhibit some aluminium, but as this metal is only used in this instance for decorative purposes we shall not dilate upon the beautiful statuettes and groups which are exhibited by the above firm. From these specimens its applicability to these purposes is fully proved. Although some doubt was formerly expressed, its preservative properties have been since well proved, and if sufficient purity is attained the metal is practically untarnishable.

*Scientific Instruments.*—Messrs. Spencer and Son, of Dublin, in a neat case containing some very good chemical and other instruments, showed one of Professor Jellett's saccharometers. As this form of saccharometer is little known in England, and as it is a matter of some importance, I make no apology for dwelling at some length upon it. The original description will be found in the *Transactions of the Royal Irish Academy*.

Professor Jellett says that his saccharometer is capable of giving more accurate results than those obtained by means of the instrument of Soleil. He adds, that as far as he can judge, both from his own experiments and the report of others who had used it, the errors to which even an accurate observer would be liable, in attempting to estimate the strength of a saccharine solution could not be reckoned at less than half a grain per cubic inch for a single observation.

If the experiment be carefully conducted, and if there be no error in the strength of the standard solution, the error in the measurement made as above described, ought not to exceed 0.02 grains per cubic inch for a single experiment, and if the mean of a number of experiments be taken the error will of course be less.

It is not desirable to use a very strong solution of the substances to be examined. No general rule can be given for determining the strength of this solution which it is desirable to use. If the law of Biot, that the amount of rotation produced by the same substance in the planes of polarisation of the different simple rays are proportional to the squares of the corresponding

indices, be strictly true, then the more nearly these indices are in the same proportion for the fluid under examination and the compensating fluid, the stronger may be the solution used. If the fluid under examination be a saccharine solution, and the compensating fluid French oil of turpentine, a solution containing in each cubic inch thirty grains of sugar may be used without inconvenience.

The importance of such an instrument to the practical chemist is at present hardly appreciated. The writer had some experience in connexion with the verification of turpentines some short time since, which was effected by the aid of Professor Jellett's instrument. French turpentine and American turpentine have opposite rotatory powers, whilst the turpentine substitutes, or products of American mineral oils, are inert; not only can, therefore, a qualitative investigation be instituted, but a quantitative one may be performed. Professor Jellett's investigations in connexion with the distribution of acids and bases in solution and upon the alkaloids (part of them still unpublished), are some of the most curious that we have read for some time. We must confess that in spite of precedent we should prefer a better name than a saccharometer for this instrument. Professor Jellett evidently sees this, for he remarks that the name is derived from one important use to which it may be applied. "This, however, is only one of its applications, and there are many others at least as important. It may generally be defined to be an instrument by which the ratio of the rotatory power of any transparent fluid to that of a standard fluid may be accurately determined."

The following firms showed fine specimens of scientific instruments, principally cameras, microscopes, surveyors' instruments, and barometers:—Messrs. Yeates and Sons, Dublin; J. H. Dallmeyer, London; Crouch, Bros., of London, who also exhibited some very fine microscopic photographs of a considerable size. More is frequently to be gained from the study of these photographs than by ocular examination of the object when in the microscope. H. Webb, of Birmingham, showed what appeared to be a very fine collection of microscopic objects, as far as an opinion can be given without an examination under the instrument. Field and Son, Birmingham, also exhibited their wonderfully cheap microscopes.

John Young, of Dalkeith, showed moulded carbon for electric batteries. This gentleman first undertook the task of making a series of experiments in connexion with the above subject at the request of several gentlemen interested in the progress of electrical science. The carbonaceous material (coal, &c.) is ground to a very fine powder, moistened, and moulded into the form wished, in a manner similar to the making of bricks. The forms so moulded are then slowly dried, and, when dry, packed into iron moulds, and subjected to a bright heat in a close oven. The effect of the heat is to drive off the whole of the bituminous matter, leaving a dense and compact coke in the moulds. The pieces are then boiled in pitch, and again charred along with a charge of coal in a gas retort. This is repeated several times, until the required density is attained, when they are ground into the proper shape, and smoothed on the surfaces. They are then kept for twelve hours in a gas retort, along with coal, the latter being used to produce carbonaceous vapour, which saturates and closes the pores in the coke. When the process is properly conducted, the carbons are taken out, possessing a close metallic steel-grey surface. They are much more porous than retort carbon, by which they acquire high electro-negative qualities.

The following few articles possess such interest in a technical point of view that the present article would hardly be complete without touching upon them. One of them is Messrs. Morton's patent refrigerator. This arrangement may be viewed as a worm, except that the wort or liquids to be cooled are made to traverse the exterior of the metallic tubes in which is circulating the cooling medium. This apparatus consists of a series of flattened tubes made of strong copper (tinned), and connected at the ends alternately by the caps, so as to admit of a continuous flow of cold water inside the tubes. The whole is fixed to a copper case, and secured in a strong wood frame. The worts are admitted at the other end, and flow in an opposite direction to the water alternately under and over the tubes, this motion being produced by the longitudinal ribs on the top and the corrugated bottom. The absolute necessity for the rapid cooling of worts is now fully recognised by all brewers who have made the chemical laws which govern vinous fermentation their study.

The applications of graphite—or black lead, as it is sometimes called—have become very numerous of late; thus it is extensively used for electric purposes, the glazing of gunpowder and shot, black lead pencils, and last, but not least, the making of plumbago crucibles.

The Patent Plumbago Crucible Company exhibit specimens of their crucibles, so much appreciated by metallurgists. Mr. Brodie's well-known and beautiful process of disintegrating graphite has enabled the most inferior qualities of that mineral to be made available. The Plumbago Crucible Company, however, purify their graphite by passing chlorine through it when heated to redness, or in some cases simply by separating the iron, which is the great impurity, by magnets. The graphite so prepared answers their purposes as well as Mr. Brodie's, and is less expensive.

It is stated that a large deposit of graphite has recently been discovered by an enterprising Frenchman, M. Alibert, in the Batougal Mountains of South Siberia. The higher class graphite in this deposit is accompanied by an inferior variety which, as it appears from experiments made by Mr. Valentine, can be easily purified. The Siberian plumbago is not much used at present by the Plumbago Crucible Company, as it contains too much iron, and although this could be entirely removed by the company's patent process, it is found cheaper to work with Ceylon plumbago, which contains but little iron. The graphite used by them contains 98 per cent. of pure carbon. The company exhibited Ceylon, Siberian, and other graphites in their case.

The consumption of Ceylon graphite at the Battersea Works has had an extraordinary effect upon the price of the article. When the Company commenced business it cost about £10 per ton, but now it cannot be bought at double that price. The total quantity of graphite exported from Ceylon in 1862 was 40,195 cwt., of which no less than 34,730 cwt. was shipped to Great Britain. The Patent Plumbago Company are the principal consumers of the latter.

*Minerals and Metallurgical Operations.*—There is always a great amount of speculation attached to mining operations, and many must suffer before the resources of a country are properly opened. One of the most successful companies, and most deservedly so, is the Mining Company of Ireland. It is immaterial whether we visit their mines or their factory at Ballycorus, where the smelting operations are carried on, we find the same system carried out. No expense is spared that is likely to give a return; perfect order is carried out in every department, whilst the wants and requirements of the employed are as much looked after as the working of the establishment. This Company has copper mines, coal mines, and lead mines in operation at the present time. The latter are situated in the valley of Glendalough, upon which Moore has written his celebrated poem—

“By that lake whose gloomy shore  
Skylark never warbled o'er,  
Where the cliffs hang high and steep.”

This valley also contains the ruins known as the Seven Churches, described by Thackeray with such humour. These ruins are much frequented by tourists, who, however, seldom take the trouble to push up the ravine to visit these interesting mines. At the end of this ravine is a sloping amphitheatre upon a stupendous scale. If he is of a romantic turn of mind the visitor may imagine that some Brobdingnagian carter had been shooting down, on every side into the said amphitheatre load after load of angular granitestones of immense proportions; not a vestige of verdure covers the rugged pile, and it would leave a gloom indeed if it were not for the busy scene which is going on in the little flat below. The mine comes out upon the surface about one-third of the way up the mountain, which mountain they have bored right through. The explorers go in at one side and come out in the other valley. In the lead mines, situated in flat countries, shafts have to be sunk; from the situation, the working by shafts has but a limited application in the Wicklow mine. The mountain is penetrated in the corner of the vein by “levels.” It is eighty fathoms deep (480 feet) from the apex of the mountain; the workings are carried on at a depth of more than 2,000 feet. The large amount of material actually broken up in the Glendalough mine—indeed, in all mines—to get at the ore is something tremendous. There remains under ground in broken stuff, which is called “deads,” 22,000 tons; 10,000 rejected at the surface; treated upon the dressing floors, 14,000 tons; so that 46,000 tons of ore and rock pass through the miner's hand in the course of the year. This shows a total of 46,000 tons broken to get at 1,800 tons of ore dressed for the market in this one mine; and there are many where more ore is annually turned out.

A few rare minerals are found in this mine. Thus witherite, a very rare mineral in Ireland, has been found in very small quantities in the mines of Luganure. Another barium salt in the form of heavy spar is met with in this mine, beautifully crystallised carbonate of lead, and the black variety of carbonate of lead. But perhaps the most interesting of the collateral minerals which have been found with the lead in these mines is the native silver. Bright silver juts out of the rock in most fanciful convolutions, sometimes resembling vegetation. The native silver in this mine is generally found in direct contact with a friable and apparently disintegrated ore, which consists of sulphide of silver; large quantities of this ore have not been found.

Blende is found in large quantities here, but is not worked. The finer portions of this blende get ultimately carried down from the dressing-floor into the lake, and getting into the gills of the fish, literally chokes them. It is a fact that no fish will live in the lake, and this has perhaps added weight to the line—

“By that lake whose gloomy shore.”

The circumstance that we have just mentioned has given rise to the fable that the water is poisoned by the lead; but this is not the case, as the waters have been analysed and found to be free from lead. This is a practical proof of the insolubility of sulphide of lead in water.

The quantity of lead ore raised in the whole of Europe and North America is estimated at about 190,000 tons per annum. Great Britain gives 90,000, of which 2,500 is raised in Ireland, or about 1·3 per cent. of the whole raised in the world.

Ireland yields about 14,000 ounces, or 2·4 per cent. of the whole of the silver raised in the world; its value may be estimated at about £3,850 per annum. To give an idea of the value of any mine, the tons of ore raised may be multiplied by ·7, which will give the quantity of lead.

*The Colonies.*—Canada sends a magnificent collection of minerals, forwarded from the Crown lands and by the Board of Arts of Canada, Montreal. Amongst them are fine specimens of plumbago, carboniferous pyrites, nickel ores, splendid crystals of amethyst quartz, a Canadian apatite of importance, as it can be procured in large quantities, and is said to contain 90 (80 ?) per cent. of phosphate of lime. This mineral is exhibited by Messrs. Rickman, of Liverpool.

The Falkland Islands send specimens of oil, crude and refined, from the king penguin. This is an oil something intermediate between cod oil and seal oil in its properties.

W. Mort, 155, Fenchurch-street, London, exhibits a stupendous block of malachite from the Peak Downs Copper Mines. Such a splendid specimen as this is really a treat to mineralogists.

Victoria has contributed largely. The Bank of Australasia sends a collection of gold selected and prepared by the bullion clerk and the bank assayer, Mr. Paterson. The total value of the gold exhibited in its different states is £3,359 8s. 9d. We have also £2,925 worth from the Union Bank of Australia. This is a very interesting collection, as we have specimens of all the alluvial gold of Australia and New Zealand. It is said that the gross weight of gold which has been produced from the mines in Victoria in little more than thirteen years is over 1,024 tons, the value of which is £133,861,708 sterling. The mines of Victoria are now in a more prosperous condition than they have been for some years past.

In this section there are a number of essential oils new to British commerce.

The oil of peppermint has the same character as the English oil, and is distilled from English peppermint grown in the colony. It is sold at 40s. per pound. The oil of *Eucalyptus amygdalina* can be produced wholesale at 3s. per pound; 1 cwt. of leaves and twigs yields 22 oz. oil. This oil is now being supplied to the London market. The gum of this tree is soluble in water, and possesses valuable tanning properties. Quantities could be shipped.

*Eucalyptus corymbosa* yields an oil the wholesale price of which is 6s. per pound, as 1 cwt. of leaves and twigs will only give 9 oz. of oil. The oil of *Melaleuca ericifolia* can be manufactured for 20s. per pound, 1 cwt. of leaves and branchlets yielding 4 oz. of oil. It is said that it is equal in effect to the oil from *Melaleuca Leucadendrum* (cajeput oil). It would be interesting to see if this oil consists of the dihydrate of cajeputene of Schmidt. Essential oil of *Cortex Atherosperma moschata*. The physiological effects of this oil in small doses are described as diaphoretic, diuretic, and sedative, and it appears to exert a specific lowering influence upon the heart's action. "As a medicine it has been used in the Colonial Hospitals, and employed successfully in cases of heart disease, administered in one or two drop doses at intervals." The leaves give an oil the physiological effect of which is weak in comparison.

Fine specimens of the *Xanthorrhoea Australis* or Grass Tree resin are shown. The solution of this gum in spirit leaves a bright red polish on wood. It contains cinnamic and benzoic acids; the action of nitric acid upon the gum gives rise to picric acid. The report also says that this gum will possibly be found useful for dyeing scarlet. Mr. Slater in this section also exhibits some damask roses, which are really fine commercial specimens, proving the desirability of further trying what the climate will do as regards the cultivation of perfumery plants.

*Foreign States.*—The house of Petricoli, Austria, a very ancient firm, shows in Section II. some beautifully bleached wax, and states that it is bleached naturally, and that chemically bleached wax is always tinged, and, therefore, requires the admixture of stearine or spermacetic to make it presentable. How far this is the fact has to be proved, but the wax exhibited possesses a virgin hue which the writer has never seen equalled.

In the Belgium Department there are two exhibitors of oxide of iron, which, under the name of *minium de fer*, is extensively used as a paint for metal work. That of MM. Hoorichx and Gorrissen, Brussels, consists of burnt ochre, and is offered at a remarkably low price—about 5s. 6d. per cwt. The article exhibited by De Cartier, Brussels, costs about 16s., and is quite a different product; it is got by burning and powdering hematite, and levigating it with water. It is called *minium de fer d'Anderghem*, and is being manufactured in immense quantities. M. Cartier says that it is destined to supplant red lead and other paints for iron work; colisthar, which by its mode of production always contains some sulphuric acid, a small quantity it is true, but enough to attack the iron and cut into it; whilst from statements made by eminent English and French chemists the use of red lead is injurious to the iron coated with it.\*

\* In the British Department there are some colours exhibited under the name of "Pulford's Magnetic Paints." This can be understood as regards the brown. The blues and greens proved to be ordinary colours, containing a small quantity of magnetic oxide of iron.

In the French Department, Baudesson and Hauzeau showed a novel application of photography—viz., photographs printed upon calico, in black, blue, magenta, and sepia; but they give no details of their process.

Dubosc and Co. exhibited extracts in the liquid and solid form for dyeing purposes. We believe that no mention of their preparations was given in any of the reports yet published, but they have been used with some considerable success in the Manchester houses. The liquid extracts would, in the writer's opinion, be open to the objection that the actual amount of tinctural value will probably vary very much in different samples. This will not apply so much to the solid extracts. The one examined by the writer (Persian berries) gave a bright solution and left no residue. The value of these preparations will, of course, depend upon the prices, taken in connexion with their dyeing strength.

The celebrated firm Tissier and Sons show bromine and iodine, and bromides and iodides. There is a remarkably fine specimen of bromides of potassium, if it is pure. But these specimens are shown as commercial ones, and, therefore, probably the bromide contains a little iodine. At least, it is a fact that a small quantity of iodide of potassium makes the bromide crystallize in much larger crystals.

Italy shows some beautiful crystals of native sulphur exhibited by Federico Lancia, Duke of Brolo; also some very fine specimens of worked sulphur are exhibited in Section I. The rolls of sulphur differ in form, being more conical than those found in our commerce.

Mannite, or sugar of mushrooms ( $C_6H_{12}O_6$ ), occurs very generally diffused through the vegetable kingdom. Professor De Luca, of the Royal University of Naples, has shown that mannite is present in all parts of the olive tree, and sends some beautiful specimens crystallizing in prisms from all parts of the tree. Thus we have specimens from the green leaves, from the yellow leaves, from the flowers, from the unripe olive, and from the olive just commencing to ripen. Professor De Luca says that mannite exists in every part of the olive tree—the leaves, flowers, and fruit containing the greatest quantity; the roots, wood, bark, and branches rather less. This saccharine principle is not always found in the same quantity at all stages of vegetation. At the period of blossoming it accumulates in the flowers and diminishes in the leaves; the fallen flowers having once completed the phenomenon of fecundation, no longer contain any mannite. It has likewise been found, says De Luca, impossible to obtain the slightest traces of it in the yellow fallen leaves. Mannite exists in the fruit as long as it continues green, diminishing in proportion as it ripens, and disappears entirely when it becomes perfectly ripe, and contains the greatest quantity of oil.

The chlorophylle which accompanies the mannite seems to follow its changes; the leaves are never devoid of more or less mannite as long as they continue green, but the mannite diminishes as it turns yellow.

De Luca has published a table showing the analysis of the olive leaves during six months in the year.

The investigations were commenced in the year 1858, and are going on still. My experiments are for the purpose of determining at what period of vegetation the fatty matter was formed in the olives, and what is or what are the materials which have given it birth. The close connexion of the substances which are transformed, and the influence of the place and the condition in which their metamorphoses are produced. The olives, at the commencement of their formation and of their growth, contain a green matter and traces of a fatty matter, but proportionally as the fruit of the olive develops itself and increases, the fatty matter also develops and increases. The chlorophylle, which is formed in abundance in the leaves and fruit of the olive tree, always accompanies the mannite. This leaf green exists in small quantities; when the leaves begin to develop themselves it augments with their progression, diminishes during the flowering of the plant, and when the leaves begin to lose their green tint, and it disappears entirely when the leaves are yellow and fall. The leaves of the olive tree are perpetual, that is to say, they do not become detached from the plant until the new ones are formed and developed. They must consequently fill some important function in the vegetation of the olive tree.

The olives, as long as they are green, always contain mannite; but this matter is only formed in large proportions during the first period of their development. Afterwards, when the fruit is perfectly ripe and has lost its green tint, it contains no mannite. This matter is contained in all the parts of the olive plant, and particularly in the leaves, flowers, and fruit. The chlorophylle which we find in abundance in the flowers and olives, always accompanies the mannite. The yellow leaves and ripe olives contain neither chlorophylle or mannite. The decrease of mannite and chlorophylle in the olives during the increase of the fatty matter, and the absence of the same substances when the olives contain a maximum of oil, show that there must exist some relation between all these matters, and that if the chlorophylle and mannite are assimilated they give foundation to some other substances, amongst which must figure the fatty matters.

No. 28 in Section II. is a curious and interesting product. It is exhibited by Ciaranfi, of Florence, and the Convent of the Servite Friars. It is crystallized bicarbonate of potassium, obtained by submitting a solution of commercial potash to the action of the carbonic anhydride evolved spontaneously and in great abundance from the mineral spring of Cianciano, near Poggibonsi (Sienna), and belonging to the convent. Bicarbonate of sodium, obtained by the same method, is also exhibited. They also show protocarbonate of iron obtained by the double decomposition of solutions of sulphate of iron and an alkaline carbonate, subsequently washed with distilled water, and dried in an atmosphere of the pure dry carbonic acid gas evolved from the spring of Cianciano—a process which, as the label states, could not be followed in an ordinary manufactory.

The Netherlands would hardly be well represented if they did not exhibit some madder products. The garancine and madder factory of Tiel produces a very complete collection of madder products, including alcohol procured as a bye product of the garancine process, the specific gravity being .828. In the Siam and many other departments Mr. P. L. Simmonds (well known as the editor of the *Technologist*) exhibits many substances which would be of interest to the chemist, but they are so numerous that we could not even attempt to pick them out of the catalogue. This gentleman seems to have succeeded in making an extraordinary collection from all parts of the world.

In Switzerland there is a splendid case by Henner and Co., containing some rare organic and other chemicals. To look at such a *recherche* collection of rare products as are found in this case would warm the heart of a Hofmann.

The Zollveroin department, as might be imagined, is particularly rich in geological and chemical specimens. The maps displayed by the Government Boards of Mines in Bonn, Breslau, and Halle are colossal in the extreme, and are some of the finest things in this way that we have seen; but the chemical interest is brought to a focus upon viewing a case exhibited by Th. Schuchardt, which is one of the most unique things in the whole Exhibition. It consists of a collection of chemical products used in glass staining and porcelain works. Many of these specimens, we are told, are the same as are supplied to the Imperial potteries at Sévres. M. Schuchardt also exhibits some vanadates, and a very fine specimen of red chromate of lead of a most brilliant hue. Thus a fine painter's colour may be procured for about 2s. Also a specimen of borate of manganese; this is more extensively used as a siccativ, two ounces being sufficient to make 1 cwt. of linseed oil drying. A very pretty series of nickel salts is displayed in this case. These, we believe, are used in glass staining more as decolourizers than as anything else, except the chromate, which produces a fine bluish-green glass. Some watch oils, exhibited in this section were examined by one of the jurors; they consist of olein from olive oil, very neutral, and when subjected to the continuous action of a freezing mixture remained perfectly limpid, although at the same time they became viscid. Eau de Cologne is represented by no less than three firms; each of these firms state that he or she is the original manufacturer. The woodstuffs prepared for paper makers are very good in this department, and superior to some exhibited in the Italian. They are made from the linden, aspen, Scotch fir, and pine, and excellent writing paper was shown containing 48 per cent. of woodstuff. *Apræpos* of paper, a starch manufacturer informed the writer that large quantities of starch are being manufactured now in England for paper makers. The starch is mixed cold with the pulp, and after making the paper is passed through pretty hot rollers. It will be seen that the starch granules being partially broken and converted into dextrine two objects are attained—a saving of the expensive rag stuff, and a homogeneity of texture.

### *Pharmacy at the Dublin Exhibition.*

By HARRY NAPIER DRAPER.\*

There was perhaps no other art which was not better represented in the International Exhibition at Dublin than pharmacy. This is, I think, readily explained by the fact that the London Exhibition of 1862 gave to the manufacturers of chemical preparations all that could be desired in the way of publicity, while the extensive display organized under the auspices of the Pharmaceutical Society, left little to be done in that of illustrating the position which Pharmacy now occupies. Then, again, the very products which generally excite the greatest interest are, for the most part, not those which are representative or even new, but those which—like the codeia bowl of Messrs. Macfarlane and Co., of Edinburgh, or the mass of calomel of Messrs. May and Baker in the Exhibition of 1862—cost much trouble to prepare, and are not easily

\* From the *London Pharmaceutical Journal*.

transported to a distance. Yet, there is the *British Pharmacopæia*, with all its new—if not improved—preparations which have as yet never been collectively illustrated. How comes it that no pharmacist has thought it worth the trouble to bring together a complete collection of these? Nevertheless there is—when one throws aside the catalogue, and really seeks in earnest for matter, which, if not very closely connected with Pharmacy, yet has some bearing upon it—a great deal that is interesting and some that is novel.

I propose first to speak of such specimens as appear to deserve notice, and then to describe such other objects in the Exhibition, as from their connexion with chemistry and the allied sciences, or their own scientific interest, may not be considered out of place in these pages. The order followed is of course the alphabetical:—

The case of Bewley and Draper, 23, Mary-street, Dublin (12) contains some preparations of the new *Pharmacopæia*; among others, *extractum opii liquidum* and *extractum belæ liquidum*. Some non-official preparations are also shown. There is *vinum ferri*, for example, rendered permanent by the addition of citrate of ammonia, *liquor taraxaci* and *pepsine wine*. This firm also exhibited well granulated *citrate of magnesia*, and a large display of *aerated waters*, *soda water*, *ginger beer*, *lemonade*, *ginger ale*, *Seltzer water*, and *lithia water*. I may mention, in connexion with this very favourite way of administering the carbonate of lithia, that an aerated water containing a lithium salt may be most easily distinguished from one which does not by the spectroscope. The intensity of the lithium ray is so great that it is easily recognised even in the presence of a great excess of sodium, and the scarlet band is at once produced if a single drop of lithia water be introduced on a platinum wire into the flame of the Bunsen burner.

Bewley and Hamilton (40) exhibit a pretty extensive series of chemical preparations used in medicine, and some which are connected with photography. The specimen of *iodide of cadmium* and the *bromide* of the same metal are very good. There is, however, a bottle labelled *protophosphate of iron*, the contents of which are a *green* powder. This appears to be somewhat anomalous, as well-prepared phosphate of the protoxide of iron is *blue*. In the same case are some other iron preparations which, although nicely sealed, are very different from those usually met with in commerce. The *citrate of iron and quinine* is a marked example of this. Instead of the golden-coloured preparation which is usually seen now, we have here one which is *dark red*. This is, however, precisely similar in appearance to the product of the formula of the *Pharmacopæia*. The salt will do very well for dispensing purposes, but would be at once returned to any wholesale house which should venture to send it out. Is the golden colour due to the judicious use of *potash*? How far does it depend on the state of oxydation of the iron? Why does not the British Pharmaceutical Conference elicit information on these points, and how is it that the method of producing one of the most used and most valuable of the sealed preparations of iron still remains a trade secret? A glance at this series of preparations by Messrs. Bewley and Hamilton is by no means uninteresting, showing how difficult it is for one manufacturer to succeed in producing a great variety of presentable chemical compounds. Here, side by side, are some which are very good and really pretty; others which are just the reverse. *Aloine*, for example, is dirty-brown and amorphous, and not in the least like the aloine of Messrs. Smith, of Edinburgh, which is in well-defined yellow crystals. *Iron alum* ( $\text{Fe}_2\text{O}_3 \cdot 3\text{SO}_3 + \text{NH}_4\text{O} \cdot \text{SO}_3 + 2\text{H}_2\text{O}$ ) is very good, in rose-coloured crystals; so is *valerianate of zinc*. Citrate of quinine, on the contrary, is of a dirty brown, and looks as if it had been dried at too high a temperature; and *white precipitate* sadly belies its name, and is brown also. On the whole, this series is good, and is, perhaps, better deserving of notice, since it represents a very large number of preparations in their every-day aspect, and not under the too often deceptive guise which is assumed by picked specimens. In the same case are *aerated mineral waters* in two different forms of bottle, one the usual egg-shaped kind, and the other the convenient “siphon,” which is so much used on the Continent.

Boileau and Boyd, Bride-street, Dublin (42A), exhibit a very fair show of chemicals, and the only specimens of *drugs* which the British section of the Exhibition contains. Among the latter are good samples of *opium* (Levant), *East India rhubarb root* and *Sumbul*. The chemical preparations in this case include specimens of *Aloine* (in good crystals and of the proper colour), *Iodide of iron* (this dry), *salicine*, *piperin*, *chloride of chromium*, and *mannite*.

One of the most interesting cases is that of the British Seaweed Company (13). This company has been established in order to work the patent of Mr. Stanford, which is based upon a very important modification of the usual method of treating seaweed for iodine, bromine, and potash. The ordinary plan consists, as is well known, in incinerating the sun-dried seaweed in the open air. The fused residue, or “kelp” is then exhausted with water, and the different salts which constitute it separated by fractional crystallization. It has been observed that when seaweed is thus burned, a very large proportion of the iodine—on the average, a quantity nearly equal to the whole yield—is totally lost; much of the potash also is volatilized. In the process

of Mr. Stanford this is avoided by carbonizing the seaweed in closed vessels at a comparatively low temperature, and then treating the charred product precisely as if it were kelp. This seems a very simple modification indeed, but it nevertheless is stated to completely fulfil the grand object of saving the iodine lost in the old process. Nor is this all. The vessels in which the charring process is conducted are *retorts*, and it therefore becomes one of destructive distillation, and the saving is not confined to the inorganic constituents, but is extended to a pretty large number of volatile organic products. Among these are *acetic acid*, *tar*, and *naphtha*. The series of specimens exhibited by the Company includes the whole range of products which can be obtained by a judicious practice of the principles laid down by Mr. Stanford. There appears to be no one of these which is not capable of being advantageously utilized; the residue from the washing of the charred weed is burned in the furnaces, and the very ash which then remains is said to be a valuable manure.

Hirst, Brooke, and Tomlinson (20) show a very good series of products, which are interesting chiefly from the fact that they are nearly all more or less connected with the distillation of wood. They include *acetic acid* and *acetates*, *pyroxylic spirit*, *pear essence* (acetate of amyloxyde), and pineapple and raspberry essences. It is to be regretted that Mr. Eschwege should not have shown here his purified wood spirit, which at the time of the London Exhibition of 1862 first attracted attention. The specimens there exhibited could not be said to illustrate a manufacture of any importance; they rather proved that wood spirit was really a fluid possessing of itself no marked taste or odour, and that both were due to the presence in the commercial article of oily hydrocarbons which could be separated by a peculiarly modified process of filtration through charcoal. Mr. Eschwege now conducts the purification of wood spirit on a very large scale, and can supply it in unlimited quantity. The specimens which I have lately examined are very much purer than that to which I drew attention in 1862.

The probability of this purified pyroxylic spirit being used as an adulterant of wine-alcohol is now so seriously apprehended by the Excise authorities, that a check is to be put upon its manufacture in the shape of a restrictive duty. Two years ago, the suggestion that it could be so employed was treated at Somerset House laboratory with quiet contempt.

The presence of the "fruit essences" mentioned in the case of Messrs. Hirst and Company reminds me that this manufacture, which may be said to have originated with the Exhibition of 1851, has, although it has attained considerable importance, not been enriched by any new organic compounds for a long time. Although nearly every fruit is now represented by an artificial essence, which more or less resembles its proper flavour, these are, for the most part, simply mixtures formed from two or more of a small series of compound ethers, either with or without the addition of essential oils.

At the time of the 1862 Exhibition, Dr. Hofmann called attention to *suberic ether*, which has been pointed out by Mr. H. B. Condry to closely resemble in odour the mulberry. No new bodies of this class appear—at least not in the British department—in the Dublin Exhibition.

Messrs. Johnson and Matthey, whose names have become as closely associated with platinum as that of Mr. Sonstadt with magnesium, or that of the Messrs. Bell with aluminium, contribute an array of specimens of unrivalled excellence and beauty. Their case was indeed the great attraction of the scientific part of the Exhibition. Passing over the platinum apparatus, which is, of course, chiefly that employed in the sulphuric acid manufacture, and an admirable show of analytical *desiderata*—among which a crucible of lustrous gold is particularly beautiful, and might almost excusably be coveted by a chemist—I may dwell for a moment on the illustrations of the newly-born *magnesium* industry. These, Messrs. Johnson and Matthey show, as agents for the "Magnesium Metal Company." First, there is a mass of the pure metal, weighing 134 ounces; then a solid magnesium casting—an obelisk 162 ounces in weight. The latter and a steam valve (why, by the way, choose to make a *steam valve* of so oxydizable a metal?) well demonstrate the ease with which magnesium is cast, and how well it adapts itself to the intricacies of the mould. Its low specific gravity, and the process by which, though not ductile, it is pressed into wire, are simultaneously illustrated by a coil of wire rather more than a mile long, which does not quite weigh three pounds, and by another of ribbon which weighs but two and a half pounds, and measures 4,800 feet. Both wire and ribbon are, of course, only used for the production of the "magnesium light." It has, by the way, been lately pointed out that a compound strand, consisting of one magnesium and one zinc wire gives a light of great brilliancy at, of course, less cost than if the alkali-metal alone is employed. This statement, however, requires confirmation.

The lightness of *aluminium*, and the marked difference between its specific gravity and that of silver, are very strikingly illustrated by two bottles, one of which contains six leaves of the former, and the other six leaves of the latter metal. The silver weighs 22 grains, the aluminium 1 grain.

There is, on one of the shelves of the case, a saucer of *platinum black*, and, I suppose, it

was because I had never seen so much of the metal in this form before that the idea occurred to me, that with the aid of an ounce or two of platinum black, an apparatus might be easily constructed for oxydizing a sample of a preparation supposed to contain methyl-alcohol, and thus obtaining *formic acid*, the presence of which would be demonstrated by the method of Mr. Miller. The collection of the *rare metals* in this case is of especial interest. It comprises *osmium* (alloy of osmium and iridium), *tellurium*, *rhodium*, *ruthenium*, and *palladium* (chloride, ammonio-chloride). There are also beautiful specimens of *silicium* (this very like resublimed iodine), and *boron* (just as closely resembling the iodine of commerce), beautiful feathery crystals of the *iodide* and *bromide* of *cadmium*, splendid golden-yellow of the *nitrate of uranium*, and the gorgeous, diaphanous, vivid green of its *protosulphate*.

Johnson and Sons, Basinghall-street (22), show many of the pieces of platinum apparatus which are exhibited by their competitors. They have also some prettily-finished spoons, &c., for blowpipe analysis, *cadmium* and *bismuth* in ingot, (How is it, *par parenthèse*, that it is so difficult to obtain bismuth in commerce free from copper?) and tough-points of nitrate of silver, understood to be obtained by adding a little hydrochloric acid to the fused salt, and so contaminating it with a trace of chloride. The only novelty here is *sulphate of zinc points*, prepared by fusion.

*Palmas qui meruit ferat* might appropriately be the motto of Price's Patent Candle Company. When one remembers how comparatively short a time has elapsed since *palm oil* was considered to possess little or no commercial value, the progress which has been made in the practical applications of this substance becomes remarkably interesting. There are few who are not familiar with the process patented by Mr. Wilson, by which the oil is decomposed into its constituent fat acids and glycerine. Those who are not, may be reminded that this is done solely by the use of steam at a high temperature—"superheated," as it is called—and that the fat acids distil over together with the glycerine, but no longer chemically combined with it. To the pharmacist this process is of especial interest, as being the source of the first—as it is still the best—*pure glycerine* which was to be obtained in commerce, while it gives the candle manufacturer a series of fatty acids of a degree of purity before unexampled.

The specimens exhibited in the beautiful case of the Company (31, *nave*) almost exhaustively illustrate the technology of palm and cocoa-nut oils. With the former we have as a starting-point the *palm nuts* themselves, then *palm oil*, *palm-oleic acid*, and *palmitic acid*—this last in crystalline masses of snowy whiteness. Let me stop here for a moment to point out that these beautiful fat acids—perfectly free from rancidity, and not prone to change—of constant composition and melting-point, and often brilliantly white—are too much neglected by the practical pharmacist. They are easily obtained in any required quantity, and are very cheap. I feel convinced that, ere long, alloys of one or other of them with either the fluid fat acids or with neutral oils will replace the changeable and unsatisfactory lard as bases of ointments. And the oleic acid of palm oil, unlike the oleic acid of tallow, is nearly scentless, and answers admirably for preparing *oleum morrhue cum quind* by the method of Dr. Attfield.

I do not think that the beautiful specimens of glycerine, which have so artistically been made to adorn this case, call for any especial notice. Here, however, is a practical fact. My friend Mr. Tichborne finds that Price's glycerine, as it comes into the market, has a specific gravity of 1.253, and that this density is scarcely increased by evaporation at 212° F. Many of the German glycerines range nearly as high as this, but I have never yet seen a specimen "equal to Price's in every respect," and although taking their very low cost into consideration, they are fairly good as a rule, I once met with some which were far from being so. It was in a cask: I think there were about fifteen gallons of it, and my attention being attracted by its great thickness, I was led to examine it, when it proved to be pure *sugar*. How it was made I have not the least idea, but I have never seen a more beautiful specimen of uncrystallized glucose. The maker must have been somewhat of a philologist, for when taxed by the importer with the fraud, he took, I heard, the ingenious line of defence that as *γλυκός* meant "sweet," he was justified in selling sugar of fruit instead of sugar of fat!

This Company also exhibit *cocoa-stearin*, *cocoa-stearic acid*, and *cocoa-olein*.

There are some objects in the British department which, although not strictly pharmaceutical, possess a certain interest for the scientific pharmacist.

The excellent series of products illustrative of the manufacture of *paraffine*, shown in the case of Mr. Young, of the Bathgate Chemical works, is of peculiar interest. Starting with the examples of the different varieties of *shale* and *cannel coal*, among which the *Boghead cannel* itself, the mineral which has been the cause of so much vexatious litigation, is of course prominent, we have the whole range of products which are obtained by its destructive distillation at a low temperature—*Naphtha* (not a little used during the late high price of turpentine as a substitute for that liquid), *burning oil*, the familiar "*paraffine oil*," *lubricating oil*, and lastly, *solid paraffine*. It is much to be regretted, that a substance, which, at first sight, would appear to be admirably suited for many pharmaceutical purposes, and which, if it would only permit of being introduced into

ointments, for example, would possess the great advantage of not suffering oxidation, should still remain without any application in pharmacy. Paraffine is, however, a most intractable material. It will not form good mixtures with the solid fats, and persistently crystallizes from its solution in liquid oils. Some years ago a French perfumer published a pamphlet, in which a very little information was diluted with much ingenious advertising, and which gave what professed to be a formula for "hygienic cold cream." This was to be made with paraffine and almond oil, but I need scarcely say that the combination of these into a smooth uniform ointment is impracticable. Still, paraffine is not quite useless in shop and laboratory; as it is unacted upon by either strong acids or concentrated solutions of caustic alkalies, it may be usefully used for smearing the stoppers of bottles containing either, and so preventing their becoming too tightly fixed. Even solid caustic potash, chromic acid, or permanganate of potash, may be, with safety, enclosed in paper which has been prepared with paraffine, in the same manner as in making wax-paper.

The *alkali* manufacture is illustrated by but a single British exhibitor. Messrs. John Hutchinson and Co. (36), Widnes, Lancashire have, however, a very good series of specimens. These include *soda ash*, crude and refined, *salt cake*, *caustic soda* of 60 and 70 per cent. real alkali, and *bicarbonate of soda*; *sulphur* from "alkali waste" (which is, I suppose, sulphide of sodium) is also shown. The most interesting part of the collection is, however, two beautiful crystalline groups, one of *carbonate*, the other of *bicarbonate of soda*. These are as nearly as possible alike in general contour, and are precisely identical as regards the form of the crystals. The bicarbonate has of course been made by exposing a mass of crystalline monocarbonate to the action of an atmosphere of carbonic acid, and the crystals are therefore *pseudomorphs*.

There are several exhibitors of *fats* and the *fatty acids* used in the manufacture of soap and candles. An article called *wax soap* is understood to be manufactured from the product well known in commerce as "Japan wax." There is, however, no evidence that the soap, which is of particularly nice appearance, owes to wax anything more than its name. The fat acid obtained by decomposing it, has all the characters of that from cocoa-nut oil, which is well known not to be one of the best materials for the production of a really good soap. Japan wax is—like paraffine—a substance, of which the applications are very limited; it has the curious property of communicating to any fatty solid, with which it may be mixed, a very marked tendency to become split or fissured in cooling. The great bulk of that which is imported into this country, is, I believe, employed in the manufacture of "night-lights." While on the subject of wax, I must not omit to notice the very good specimens of both *bleached* and *unbleached wax* shown in the case of Mr. J. G. Rathborne of Dublin (1831). In connexion with wax bleaching, there are one or two facts, which, if well known, are certainly not generally mentioned in treatises on technology. One is, that the wax produced in the British islands bleaches much more readily than African or West Indian wax, which are avoided by bleachers; another, that it is apparently not possible to remove the last traces of colour from this substance, no matter how long the action of light may be continued. All the *pure white* wax sold contains a very large proportion of *spermaceti*; much of it consists of little else. It is remarkable that no chemical process of bleaching this substance has ever really succeeded; all those which have been tried exercising a deteriorating influence on the wax.

Messrs. W. J. Kane and Son, Dublin (23), who are well known as large manufacturers of *sulphuric acid* and *chloride of lime*, show both these products. The sulphuric acid is exhibited of two different densities—the "brown acid," sp.g. 1.750, used wholly by manure manufacturers, and the colourless concentrated acid, sp.g. 1.850. Nearly all the sulphuric acid made in Ireland is produced from the iron pyrites of Wicklow, containing a large proportion of sulphide of arsenic, which, of course passes, as arsenic acid, into the acid itself. The acid is, however, prepared from Sicilian sulphur for pharmaceutical purposes.

The Messrs. Kane also exhibit commercial *hydrochloric acid* and *salt cake* (sulphate of soda), the latter containing 99 per cent. of real sulphate. These specimens, which are all very good, are put up in a slovenly manner, which is not calculated to produce a favourable impression upon the visitor who does not know the reputation of the exhibitors, or the uniform excellence of their manufactures.

*Perfumery* has several representatives in the Exhibition, but the more practical *shop* view of the manufacture has in most cases been preferred to any attempt at the scientific illustration of the art. If there is any exception to this rule, it is in the case of Mr. S. Piesse (29), who has certainly done a great deal in many ways to popularize a knowledge of the principles upon which the extraction of flower scents depends, and has also given not a little information to those who best know how to apply it. Mr. Piesse does not, however, show any novelties; what he does exhibit is for the most part a number of large bottles containing the principal simple odours which are used by the perfumer, as *jasmin*, *cassia*, *rose*, *violet*, *musk*, *vanilla*, &c. One of these is extract of *civet*, a perfume which is not, I think, much used in actual practice. In this case are also *sachet powders*, and examples of some compound perfumes. It has often struck me as a

question worthy of being settled by actual experiment, whether (seeing that by distillation all odours are more or less modified—that, for example, the perfume of otto of rose bears but a distant resemblance to that of the flower, and the scent of the finest neroli is as unlike that of orange-flower pomade as is bitter almond oil to nitro-benzol) some of the perfumes for the extraction of which we at present depend alone upon distillation, might not be more advantageously prepared by the process of *enfleurage*. It is not at all improbable that there would be as much difference between “lavender water,” “spirit of peppermint,” or *aqua sambuci* thus obtained, and the products which we are accustomed to, and consequently a nearer approach to the actual odour of the flowers, as in any of the instances I have adduced.

We should have to learn one thing, however, before we could do this, how to prepare *scentless fats*. Until this can be done, any attempt of the kind would be futile. Any one who can tell us how the flower-farmers and perfumers of Nice and Grasse prepare the *odourless grease* which is used for the finest pomades will be conferring a positive benefit on pharmacy, for the non-permanence of ointments is certainly one of the many things for which we have yet to find remedies.

Mr. E. Rimmel (38) has, it is scarcely necessary to say, a handsome case. He shows *perfumes, toilet soaps, perfumed bouquets* of artificial flowers, and *perfumed vaporizers*.

Among non-pharmaceutical products of direct chemical interest, the beautiful *coloured starches* shown by Messrs. J. and J. Colman (39) deserve notice. They are simply ordinary starch delicately tinted with the aniline dyes; but the effect produced by their tasteful arrangement in the thin glass vases in which they are shown is very beautiful. They are intended for application to light fabrics, as muslin, &c., and fulfil the double duty of stiffening and of communicating a pleasing tint to the surfaces to which they are applied. I call attention to them here for two different reasons: one is, that they are examples of the most recent adaptation of these exquisite colours; and the other, that they have suggested to me a possible application of starch to the preparation of *medicinal extracts of definite strength*. A liquid extract can always be made to contain, in a given volume, the same amount of the soluble principles of the vegetable substance which it represents, and is, as a rule, more to be depended upon than one which has perhaps been more or less altered by the heat required to give it a solid consistence. The consistence of a solid extract is moreover quite arbitrary, and is not capable of being expressed by reference to any fixed standard. But if a fluid extract of known strength were dried upon a given weight of starch at a low temperature, a dry powder at once, of definite medical value and convenient for manipulation, would be obtained. If such a plan as is here suggested should be available at all, it would, of course, be most successful in the very cases in which it would be most valuable—that is, with extracts which are usually prescribed in small doses. It will, of course, be remembered that we have in the pepsine powder of commerce an example of the same principle.

Mr. J. W. Hart, London (53), deserves much credit for the very instructive series of specimens illustrative of the manufacture of *isinglass* which he exhibits. They consist of the different varieties of isinglass which find their way into commerce; thus, we have of leaf isinglass the *Hudson's Bay*, the *Samovey* and the *Astracan*, and of other forms the *Brazil lump*, *Siberian purse* and *Samovey book*. So far for the manufactured article. Then follow illustrations of the manufacture, which, by the way, include some very good and clear photographs of the machinery employed in this industry. The same weight—four ounces—of Russian isinglass is shown first as a sheet eight inches square by one-eighth of an inch thick, and then cut into the familiar “shreds,” of which we learn that this quarter of a pound contains no less a number than 50,000, and which would, if laid in a continuous line, measure 12,700 yards. Several qualities of cut Russian isinglass are exhibited, from brown to nearly quite white, but it is not stated whether the difference is produced by the action of any bleaching agent.

There is a very ingenious contrivance shown in Section XXII. (636) by Mr. S. Bourne which is worthy of notice, as I can easily imagine many cases in which a modification of it might be turned to account by the pharmacist. The invention has for its object the preservation of liquids which are liable to be injured by exposure to the air, and is especially intended to be applied to casks used for containing beer, or wines which, like claret, are of low alcoholic strength. As applied to a cask, it consists of, in the words of the patentee, “a thin membrane which divides the interior into two separate chambers, the lower of which contains the liquid, while the upper is filled with air that enters as the fluid is drawn off. It is so constructed as to adapt itself to the shape of one-half of the vessel, to the centre of the sides of which its edges are attached, so as to form an air and water-tight junction, and to have free motion either upwards or downwards.” The arrangement, as shown, is simply this:—A cask, placed in the position which it usually occupies when in use, is divided into two equal portions by a thin sheet of *caoutchouc*, which is inserted between the staves. When the cask is full, the india-rubber of course is in contact with its superior *parietes*; as the liquid contents are drawn off it floats upon the surface,

and without doubt excludes air. I need not here enter into the question of the practicability of employing an arrangement of this nature on the large scale, but I think, as I said before, that it is suggestive. Mr. Rourne himself says that it affords to chemists and druggists "the means of keeping ready for immediate use many infusions, solutions, and other preparations which involve delay in making on each separate occasion."

In Section X A (300) Messrs. Spencer and Son, Dublin, show, together with other philosophical instruments of excellent workmanship, the new *saccharometer*, invented by the Rev. John H. Jellett, M.A., F.T.C.D.

The new apparatus consists of, firstly, a means of obtaining a parallel beam of light; next, a Nicol's prism, by which this beam is polarized. The polarized beam passes through a tube containing a fluid, having a rotative power opposite to that of the fluid under examination. This latter fluid is contained in a narrow tube, the ends of which are closed by plates of parallel glass, and this tube has a motion along a graduated bar, and can be made to enter the larger tube containing the turpentine or other compensating fluid to any required depth. As the zero of the scale is made to coincide with the point at which the narrow tube dips in the compensatory fluid to the furthest extent possible, it is plain that the reading of the scale will indicate exactly the length of the column of fluid interposed. The analyzing prism and an observing lens complete the instrument.

Now, bearing in mind that the principle of this saccharometer is the comparison of the degree of rotation of a fluid whose rotative power is unknown, with that of one in which it is known, we will suppose that we are about to ascertain the strength of a given solution of cane-sugar. In this case French oil of turpentine will be the compensating fluid, and the vessel before described is filled with it. The tube is then filled with a sugar solution of *known strength*, and the zero of the vernier made to coincide with the zero of the scale. The tube is now moved back by means of its attached milled head until the tints on the two halves of the circular spectrum, which is seen on looking through the analyzing prism, become equal in intensity. The reading of the scale is then noted. Let this be called *R*, and let *S* be the strength of the known sugar solution.

The sugar solution of known strength is now removed from the tube, and replaced by that of which the strength is required. The same process having been repeated, the scale is read, and the new reading called *R'*. Then the quantity of sugar contained in the unknown solution is obtained by the equation:—

$$S' = \frac{R'}{R} \cdot S.$$

If the operations have been carefully conducted, the error should not, according to Professor Jellett, exceed 0.02 grain per cubic inch for a single experiment. Of course this error would be even still less, if the mean of a number of experiments be taken.

Professor Jellett has called the instrument a *saccharometer* because it would be best recognized under this name, but he more accurately defines it to be "an instrument by which the ratio of the rotatory power of any transparent fluid to that of a standard fluid may be determined."

Professor Jellett is at present engaged in a series of researches on the alkaloids, which I have reason to believe will be, when published, of the highest value, as by his method many questions can be solved which chemistry is incompetent to answer. My readers know already that the identity of the *aconella* of Messrs. Smith, of Edinburgh, with *narcotine* has been conclusively established by Professor Jellett. The adulteration of glycerine with sugar, the substitution of carbolic acid for wood creasote, the admixture of the lighter petroleum oils with turpentine, or of French with American turpentine, each and all of which can be readily detected in this way, are only a few examples of the aid which chemical analysis is likely to derive from this valuable instrument.

*Colonial Possessions.*—The general collection from the Bahamas, which consists principally of indigenous woods, including a few things of pharmaceutical interest, as cascarilla bark, wild cinnamon, and ambergris. Myrtle wax from the berries of *Myrica cerifera* is also shown; this wax is remarkable for its *green* colour, which would appear to be due to the presence of chlorophylle. The *Myrica cerifera* is said by Richard to be abundant in the United States. The berries are covered with a waxy coating of shining whiteness, and on being boiled with water, yield about one-fourth of their weight of the wax. The green colouring matter is removed by ether. The authority already quoted, observes that the *Myrica* thrives well in the climate of Paris, and that the extension of its culture would be very desirable.

The collection from the Falkland Islands includes specimens of *Penguin oil*, both crude and refined. This is, I suppose, used by carriers, as its very repulsive taste and fishy smell would quite unfit it for burning or being a substitute for cod-liver oil, which it somewhat resembles in general character.

The Secretary of State for India has sent to the Exhibition a most comprehensive collection, illustrating the mineral, vegetable, and animal products of the country. This case is one of the most interesting in the Colonial Department, and its contents are well worthy of study. The collection of seeds producing fixed oils, and of the oils themselves, is particularly complete and instructive. The oils are placed in tubes of clear glass, which are enclosed in the boxes containing the seeds, so that each seed is placed in juxtaposition with the oil which it furnishes. Thus we have linseed from Bombay, Bengal, and Mirzapore; rape from different provinces; mustard, sesame, ben (*Moringa pterygosperma*), poppy, safflower, ramtil, (this, the seed of *Guizotia oleifera* is apparently what is known in English commerce as "Niger seed"), cucumber, ground nut (*Arachis hypogæa*), punnay (*Calophyllum Inophyllum*), and poonga (*Pongamia glabra*). Among the fats or solid oils are "vegetable wax from castor oil" (a product about which it would be desirable to learn something), kokum butter (*Garcinia purpurea*), and Illopie and Mowha oils, the products respectively of two species of *Bassia-latifolia* and *longifolia*. There is also a specimen of Piney tallow (*Vateria indica*). I do not know whether this specimen is in the solid state or not; if it be, it is remarkably transparent and looks more like very fine resin than a fat. Piney tallow is, however, said by Babbington to fuse at 97° F., and as the temperature in the Exhibition building cannot be far short of this, I do not feel very certain about it. The fat certainly is worthy of being examined; Muspratt says that candles made with it do not evolve acrid vapours when extinguished. Perhaps we may look here for a new glycerine.

Specimens of Cashew nuts (*Anicardium occidentale*), marking nuts (*Semecarpus Anicardium*), and soap berries (*Sapindus emarginatus*) are also shown. In the collection of spices, a few products are shown which are novel, as for example tejpat leaves, the produce of *Cinnamomum*, and a few others which are scarcely classed under this head in Europe, as mint leaves and cubebs.

The *Materia-Medica* collection is very extensive, and besides containing specimens of all the Indian drugs known to British Pharmacy, includes a vast number of others which are unknown even by name in this country.

In the collection sent by Mr. E. Simmonds to represent the products from Lagos, are Egusé and Tallicoona oils, Bene oil, and ground-nut oil (*Arachis hypogæa*).

In the very fine general collection from the Mauritius, vanilla is, of course, conspicuous. Some of the specimens are particularly beautiful, and nearly all are covered with the efflorescence of the active principle *vanillin*, or are, as the French say, *givrée*. The strictly pharmaceutical part of the Mauritius collection is, however, included in a small case sent by Dr. Louis Bouton, and which contains a number of medicinal plants indigenous to the island, and copies of his work, *Plantes Médicinales de Maurice*, which I can recommend to any who may be interested in the subject as a most compendious and clearly written book. Dr. Bouton has arranged the plants under their natural orders, and the plan of description is very much to be recommended. He gives the generic name and its etymological origin, the specific name, the *habitat*, and the distinctive characters; then the local name, and its English, French, and Indian synonyms. It must be understood that the book is not merely made up of so many pages of dry botanical description, but contains a vast amount of useful and interesting information on the properties of plants, with which we at home are either in total ignorance, or about which we have very imperfect knowledge.

VICTORIA sends, among a collection of products which appear to typify almost the entire natural resources of this important colony, a great many things connected with pharmacy.

Mr. J. Bosisto, Richmond (31), forwards some specimens of essential oils, which are quite new to this country. That of *Amygdalina odorata* is said to be sent to London, and used in perfumery. Oil of the bark of *Atherosperma moschata* is stated to be used in the colonial hospitals as a diaphoretic, diuretic and sedative. The dose in which it is administered is from one to two drops at intervals of six or eight hours. The oil of the leaves of the same plant possesses similar properties, but in a less degree. Essential oil of *Melaleuca ericifolia* ("Australian Cajeput"): the note referring to this oil, in Mr. Bosisto's circular, states, that it is "equal in effect to the oil of *Melaleuca leucadendrum*." I have not yet had time to devote to any detailed examination of these oils, but they are all wonderfully alike in odour and general character. It is, however, just possible that one or two of them may find an application as perfumes for soap, and the Cajeput oil deserves to be made the subject of experiment.

Mr. P. Boardman, of Nunawading (30), also sends a collection of essential oils, which includes some of those already mentioned, and in addition, oil of *Eucalyptus corymbosa*, oil of caraway, and oil of peppermint. This last is far superior in quality to the finest American oil I have ever seen, and might fairly be put into competition with English; the price is 40s. per lb. The Victorian catalogue gives also some other prices; that of the oil of *Eucalyptus amygdalina* is 3s. per lb.; of *Eucalyptus corymbosa*, 6s.; the oil of *Melaleuca*, 20s. The latter at this price is not likely to supersede genuine cajeput oil.

Some interesting gums are also exhibited in the Victorian department. Those from *Eucalyptus odorata* and *fabrorum* are stated to be soluble in water, and applicable for tanning purposes. Gum *Eucalyptus rostrata* (red gum) is astringent, and recommended as a substitute for kino. Chevallier says that it is inferior to kino in medicinal value. The resin of *Xanthorrhœa australis* is soluble in spirit, "leaves a bright red polish on wood, when used as French polish; contains cinnamic and benzoic acids." The action of concentrated nitric acid on this gum gives rise, as is well known, to picric acid.

Among other specimens shown are balsam of *Amygdalina odorata* (by distilling the leaves), berries of *Drinys aromatica*, or, "Australian pepper" leaves of *Senecio Bedfordii*, the under surface of which is covered with a thick white down, the use of which as a paper material is suggested. One pound of leaves gives about an ounce of this white flock. The other specimens are wattle galls, resin of *Callitris verrucosa*, bark of *Atherosperma moschata*, and very good native grown rose leaves. Hood and Co., Melbourne (37), send a very good collection of chemical products, among which there is of course nothing novel, but many of them will bear comparison with the best preparations of English manufacture.

FOREIGN STATES.—From AUSTRIA are sent wax, both bleached and unbleached; the former is cut or shaved in small pieces, with the view of increasing its apparent whiteness, so that it is impossible to compare it fairly with the bleached wax of home production. R. Lochnert, Bohemia (3), has a good collection of dextrines, "gum substitutes," and other modifications of torrefied starch.

BELGIUM.—Bruneel and Co., Ghent (14), have a good series of products from the destructive distillation of wood. Blondiau, Alost (26), sends glucose, a substance which is now prepared in vast quantities from farina, and finds a ready sale in this country, being probably used as a source of alcohol.

FRANCE.—MM. Baudesson and Houzeau, Rheims (5), furnish an extensive series of chemical products and specimens of "photography on tissues" concerning the latter no information has been afforded.

E. Dubosc and Co., Havre (6), contribute specimens of liquid and solid extracts of dyewoods. Of these I have examined those of logwood and Persian berries, which are of very good quality, and are nearly totally soluble in cold water. The other French exhibitors of chemical products are MM. Tissier (Conquet), Rocques and Bourgeois (Ivry), and Odeph, Luxeul (23). The last-named shows extract of pomegranate, a preparation which, by the way, might very advantageously be introduced into English pharmacy. The value of pomegranate bark as an astringent in diarrhœa, although popularly appreciated, is not sufficiently recognized by physicians.

ITALY.—In this department there are, of course, several exhibitors of sulphur, of which many of the specimens are in very fine crystals. The chief contributors of sulphur are S. Barbagallo (Catania), the Duke of Brolo (Palermo), and the proprietors of the Romagna sulphur mines (Bologna). Oils of lemon, orange, and orange flower, and of bergamot, are sent by the firms of Melissari (Reggio) and Antonnio (Catania). Citric acid, not very remarkable for whiteness, is shown by A. Campisi (Catania). A very extensive series of chemical products, presenting, however, nothing very remarkable, is contributed by Candiani and Co. (Milan). It includes, however, borate of manganese, used in the preparation of drying-oil, and said to be far more effective for this purpose than oxide of lead.

Dr. Bandiera, Palermo (23), sends a styptic fluid, which, under the title of *hæmostatic water*, is said to be very effective in controlling hæmorrhage. This is, I presume, a solution of the double chloride of sodium and peroxide of iron, which was described by, I think, Dr. Phipson, in the *Chemical News* some time since.

A very interesting series of specimens is contributed by the Convent of the Servite Friars, Sienna. The monks appear to turn to good account the carbonic acid evolved from the mineral springs of Cianciano, and manufacture by its aid very good bicarbonate of potash and bicarbonate of soda. They make also *protocarbonate of iron* by double decomposition of the sulphate and an alkaline carbonate, and then drying the product in an atmosphere of carbonic acid. I had hoped that the carbonate thus obtained might really be something more than sesquioxide, and that the Servite Friars might be able to supply English pharmacutists with a product which we have no opportunity of preparing for ourselves, but I was not a little disappointed to find, on examining the "protocarbonate," that it contained but a trace of carbonic acid, and was little, if at all, more deserving of the name than the oxide of our own Pharmacopœia.

In the Japanese collection are one or two small rolling blinds, made of the mysterious "rice-glass," about which there was so much discussion at the time of the London Exhibition of 1862. As they hang here, however, the only senses which one can bring to bear upon any attempt at unravelling the supposed secret of the composition of this glass, can discover in it nothing which in any way distinguishes it from the ordinary glass of our own country.

SIAM—or rather Mr. P. L. Simmonds, who appears to represent all the out-of-the-way countries in the world at the Exhibition—sends some curious things. Wood oil, seeds of *Nelumbium speciosum* (which are made into flour, and eaten like chestnuts), bastard cardamoms, *sipziel*, and *pun*—both *desiderata* to the full enjoyment of betel, the *pun* being lime, coloured pink by turmeric, and *luet nangret*, the coagulated blood of the rhinoceros, used in medicine.

From SWITZERLAND we might, of course, expect to receive good samples of sugar of milk, and those sent by the Brothers Lotscher, Marbach, (2) are very good indeed; but one could have scarcely hoped to have found among the contributions from this country so magnificent a collection of chemical products as those in the neat case which bears the name of Henner and Co., Wyl, (1). A chemist, without even being at all enthusiastic, might spend an hour before this case in contemplating products which are rarely seen out of the laboratory of research. The pharmacist will find in it specimens of salts with which he is indeed familiar, but which in the new beauty which they borrow from perfect crystallization and absolute purity, almost assume a new character. The photographer will recognize the compounds with which he is accustomed to manipulate, but he can scarcely hope to procure such chemicals through the ordinary channels. The price-list of MM. Henner lies before me, and although there is a novel sensation experienced in seeing such names as *kakodyle*, *chinovinic acid*, *selenic acid*, *amygdulin*, *diastase*, *saponin*, and *mercaptan*, placed in parallel columns with vulgar francs and centimes, yet I must refrain from quoting further from its contents. MM. Henner have certainly brought together the most beautiful collection of *produits chimiques* which it has ever been my lot to inspect. If, however, it is at all approached in the Exhibition, it is by the wonderful series of metallic salts shown in the Zollverein department by Th. Schuchardt, of Muskau, in Silesia (16). This consists of a systematically arranged series of compounds of the metals cobalt, manganese, nickel, iron, copper, zinc, cadmium, copper, tin, uranium, lead, antimony, and bismuth. I may just take the cobalt series as an example, in order to show the completeness of the collection, and to give some idea of its value. Of cobalt there are shown oxide, arseniate, nitrate, phosphate, silicate, chloride, sulphate, acetate, borate, chromate, carbonate, and oxalate. The series of compounds of each of the other metals named is nearly as exhaustive. There are besides two bottles, containing perhaps more *vanadate of ammonium* and *vanadate of sodium* than perhaps exists in all the laboratories in Europe.

Remme and Friedman, Berlin, (20) have a pretty large collection of essential oils and of flavouring essences, and compound ethers. Many of the latter are used in Germany for giving distinctive character to the numerous varieties of ardent spirits, of which our Teuton neighbours are so fond. We have thus:—Berlin bitter oil, “corn brandy cummin oil,” Dantzic goldwasser oil, and Spanish bitter oil. The compound ethers are applied to the same purposes for which they are used in England, that is, to counterfeit, with more or less success, the natural flavours of wines and other alcoholic beverages. They consist, as regards the specimens in Messrs. Remme’s collection, of organic ethers and aldehydes combined with essential oils. Those shown are essences of arrack, brandy, rum, sherry, and “muscat lunel.” The last apparently consists of acetic ether and oil of neroli. The rum essence is, as far as I can analyse it by smell, aldehyde and creasote; the brandy essence, pelargonic and acetic ethers with vanilla.

11 BARRINGTON, J. & SONS, *Great Britain st. Dublin*.—Soap, candles, tallow, &c., and articles used in the manufacture of soap.

12 BEWLEY & DRAPER, 23 *Mary st. Dublin*.—Perfumery; mineral waters; British wines; pharmaceutical products.

13 BRITISH SEAWEED COMPANY (LIMITED).—*White-crook Chemical Works, Dalmuir, Dumbartonshire, N.B.* Series illustrating Stanford’s patent method of treating seaweed.

14 BRYANT & MAT, *Fairfield Works, Bow, London, E.*—Patent safety matches, vestas, and cigar lights, which ignite only on the box; instantaneous lights, &c.

16 COONEY, C. & Co.—57 to 60, *Back lane, Dublin*.—Starch; dextrine; laundry blues, with samples of the raw materials; blacking, liquid and paste.

17 FIELD, J. C. & J. 36 *Upper Marsh, Lambeth, London*.—Soap, paraffine candles; patent self fitting candles for chamber use; altar candles, sealing wax, &c.

18 GOULDING, W. & H. M. 108, *Patrick st. Cork*, and 22, *Westmoreland st. Dublin*.—Manufactured and artificial manures, with the raw materials used in manufacturing the same.

19 HARR, J. & Co. *Temple Gate, Bristol*.—Painters’ colours—greens, chromes, blues, reds, &c.

20 HIRST, BROOKE, & TOMLINSON, *Bishopgate st. Leeds, Yorkshire*.—Acetic acid and acetates; wood naphtha; artificial fruit essences; chemical and

pharmaceutical preparations, varnishes, fancy soaps, perfumery, &c.

21 JOHNSON, MATTHEY & Co. 78 & 79 *Hatton Garden, Lond., E.C.*—Platinum manufacturers, assayers, refiners, and metallurgical chemists. Precious metals and their preparations. (*East Gallery of Nave*.)

PLATINUM.—*Platinum Boiler*.—Chief use, the concentration or rectification of sulphuric acid, but capable of adaptation to other purposes. Value, £1,500. This boiler is capable of rectifying to the full strength three tons of sulphuric acid per diem; it is soldered by the patent autogenous process (*i.e.*, with platinum) saving the extra expense of gold, and being stronger and more durable than those soldered in the old fashion. Boilers, with all the recent improvements, are made capable of concentrating from half a ton to ten tons of acid per diem. *Platinum Alembic*.—For the use of mints, refineries, and chemical manufacturers, chiefly for the separation and refining of gold and silver, but capable of adaptation to other purposes. Value, £350. A vessel of this size is capable of refining 250 ounces of gold, or 2,400 ounces of silver per diem. The economy of refining the precious metals in such apparatus is not only very great, but it is effected with much greater rapidity, certainty, and freedom from risk of accident. *Platinum Syphon*, for sulphuric acid apparatus. Value, £120. The syphon shown is a small one, with ball and socket joint and clamps; it is suitable (with a proper

condenser) for a one ton vessel. Those suitable for larger vessels are made of greater length, and, with two, three, or four branches as may be required. *Platinum Pyrometer*, patent, being an "indicator" which acts by the variations of heat. It is a novel application of the spiral coil of a compound lamina of two metals of unequal expansion by heat. Value, according to size. *Platinum Tubes*, soldered with pure platinum. Patent. Can be made of any length or size. Superior to those soldered with gold, inasmuch as they are of uniform metal, and lighter than, and superior to, those made by pressure, as the metal is not subjected to the severe strain which pressed tubes have to undergo. Value, according to weight per foot and size. *Platinum Crucibles*, basins, capsules, retorts, and chemical vessels and utensils, cones for the tops of lightning conductors, &c., &c. *Platinum Wire, Sheet, Foil, and Gauze*, used for chemical purposes and galvanic batteries, also by dentists, gunsmiths, philosophical instrument makers, &c. *Platinum crucibles*, lined with gold, for laboratory fusions. *Platinum plated upon copper and upon silver* for vessels required to resist organic acids; scale and philosophical instrument makers, &c. *Platinum balls* for experiments. *Platinum in its natural state*. *Platinum crystallized and granulated*. *Platinum plate soft and hard*, and ingot alloyed with 20 per cent. of iridium. *Platinum Sponge*.—Preparations and compound salts. *Ingot of pure Platinum* (Model). Melted by the intense heat of combined gases. Patent process. Weight, 3,200 ounces. Value, £3,840. NOTE.—No heat that can be obtained by the use of fuel will melt platinum; even the heat of smelting or glass-house furnaces has no effect upon it; hence its great value for chemical purposes. But, by the new process perfected by Mr. St. Claire Deville, and carried out in England by Johnson, Matthey, and Company, viz., the heat of combined gases, under particular conditions, it can be melted with facility. The ingot to which the above particulars apply, was melted for, and shown in the Exhibition of 1862. The model afterwards taken was considered worthy of preservation, and is now exhibited for the benefit of those who did not see the original, as such a mass of fused platinum is never likely to be again produced.

**IRIDIUM**.—Ingot of pure iridium, melted by oxy-hydrogen; weight 23 ounces. Pure sponge iridium. Pure iridium and osmium, melted together to form an alloy for the manufacture of pen points. Value £6 6s. per ounce. Pure iridium granulated. Native alloy, containing the metals, iridium, rhodium, osmium, ruthenium, &c. Iridium oxide and ammonio chloride.

**RHODIUM**.—Ingot of pure rhodium, melted by oxy-hydrogen; weight, 4½ ounces. Pure rhodium, granulated. Pure sponge rhodium. Rhodium oxide and preparations.

**PALLADIUM**.—Pure foil. Sponge. Red salts and chloride.

**GOLD**.—Native gold dust and nuggets. Pure metallic gold in four stages of preparation, viz.:—Granulated gold, and yellow gold, for the use of goldsmiths, jewellers, &c.; brown gold, and powder gold, for gilding china, porcelain, and glass. *Chloride of Gold*, used in photography. Gold crucibles for laboratory uses. Gold leaf.

**SILVER**.—Specimen of pure silver, weight 41 oz. (Nitrate and other preparations are made from this purified silver.) Sterling silver for coining and for the use of silversmiths. Wire and foil for innumerable purposes, amongst others (when platinized) for galvanic batteries. *Nitrate of Silver* (Lunar caustic) fused into sticks and points for the use of surgeons; nitrate of silver, crystallized for photographic purposes; also in hermetically sealed tubes for exportation.

*Specimens of Metals*, of great variety and value, in the metallic state, and in various combinations, viz.:—Rhodium; osmium; ruthenium; *non-metallic elements*, silicon, or silicon, and boron; tellurium; selenium; cesium and rubidium, *salts*; &c., &c. Purple powder of cassius, and oxide of uranium, for colouring glass,

nitrate uranium for photographic purposes, &c. Ore of uranium (Petchblende). Touch needles, for the use of travelling jewellers, &c. Pure cadmium and its salts, for photographic purposes, &c., &c.

**MAGNESIUM**.—Produced under Mr. Sonstadt's patents. Exhibited for the "Magnesium Metal Company," by Messrs. Johnson, Matthey and Co. as their sole agents. *Pure Distilled magnesium*.—Weight, 134 ounces. *Obelisk of pure magnesium metal*.—A solid casting; weight, 162 ounces. *Turnings of pure magnesium metal*; weight, 13 ounces. *Steam valve* (Mather and Platt's improved) of pure magnesium metal; weight, 27 ounces. *Pure magnesium wire*, a coil one mile and six yards in length; weight, 47 ounces. *Pure magnesium ribbon*, a coil 4,500 feet in length; weight, 40 ounces.

The above-mentioned castings were made by Messrs. Mather and Platt, engineers to the Company.

The existence of magnesium was revealed by Sir Humphry Davy. By means of large electric batteries at the Royal Institution, Albemarle-street, London, he succeeded in decomposing sundry earths and alkalis, and demonstrated their metallic bases. Thereby he opened a new field to scientific exploration—a continent as yet virgin in many regions as America or Australia.

Magnesium dates from Davy in 1808, but for half a century it stood for little but a name in the catalogue of elements. In combination with oxygen, as the medicine *magnesia*, it was familiar to everybody, but as a metal it has been a very great rarity, preserved in bottles and sold in grains at fancy prices, and even then but seldom pure. Indeed, in several manuals of chemistry, it is so incorrectly described, that it is evident the authors had never seen the metal in simplicity.

It would appear that Davy did little more than indicate the existence of magnesium. His discoveries were too numerous for him to track out each in detail, and twenty years elapsed ere any one was tempted to resume the study of magnesium from the point where he left it. In 1827, Wöhler having obtained aluminium by the decomposition of the chloride of aluminium by potassium, it occurred to Alexander Bussy, the Parisian chemist, that it would be possible to divorce magnesium from its combination with chlorine in the same way. He tried and succeeded. He fused some globules of potassium in a glass tube with anhydrous chloride of magnesium, and to his delight obtained globules of the metal. In 1830, he made the process the subject of a memoir, addressed to the Royal Academy of Sciences.\* Bussy is sometimes credited with the discovery of magnesium, but though that honour is unquestionably Davy's, he was certainly the first to exhibit it in anything beyond microscopic quantities, and to describe its properties.

With Bussy, progress ceased for another series of years. Becquerel, by electrolysis, from a solution of the chloride of magnesium, procured the metal in minute octahedral crystals. Bunsen likewise, by electrolysis obtained the metal; and further, modified Bussy's process by adding chloride of sodium or of potassium to the anhydrous chloride of magnesium. Matthiessen in turn tried to improve upon Bunsen by adding chloride of ammonium, also reducing the compound by electrolysis: he afterwards succeeded in pressing some grains of magnesium into wire.

It was reserved, however, for Deville and Caron to make the first grand advance on the labours of Bussy. They, about 1856, effected the reduction of the chloride of magnesium by sodium in clay crucibles, using the fluoride of calcium as a flux; and so obtained magnesium in larger quantities than any of their predecessors; but their chief discovery was the volatility of the metal; they distilled a few grammes at a time in a gas carbon retort tube enclosed in a porcelain tube.†

\* *Journal de Chimie de Médecine*, March, 1830, and *Annales de Chimie et de Physique*, Vol. xlii., page 424.

† MM. Deville and Caron's labours are described, with that exquisite clearness which is peculiarly French, in the *Comptes Rendus* of the 27th February, 1857, page 394, and with enlarged experience in the *Annales de Chimie et de Physique*, 1863, Vol. Lxvii., page 347.

So far magnesium had been produced on a laboratory scale; none of the methods made any pretence to commercial application. In 1859, M. Bunsen, of Heidelberg, and Professor Roscoe of Manchester, after a variety of experiments, published their opinion of the high value of magnesium as a source of light for photographic purposes, owing to the close affinity of its chemical properties to those of sun-light; and offered at the same time some excellent suggestions as to the mode of its combustion—suggestions which have since been wrought into practice.

The memoir of Bunsen and Roscoe was read by Mr. Edward Sonstadt—a young Englishman with a name derived from Swedish ancestry—and it set him thinking whether it would not be possible to make magnesium cheap enough for at least some practical purposes. The ore was abundant: surely some means might be devised for releasing the silvery treasure from the elements which held it in obscurity and idleness!

The question started was quickly attacked with vigour, pertinacity, and ingenuity. For many months, day after day, far into the night, and often until the dawning of the morning, did Sonstadt, without cessation, first in Nottingham and subsequently at Loughborough, strive, through multitudinous and costly experiments, to compass his end. In November, 1862, he had so far succeeded, that he felt warranted in taking out his first patent for "Improvements in the Manufacture of the Metal Magnesium." His success was at the same time attested by the circulation amongst his acquaintances of specimens of the new metal from the size of a pin's head to that of a hen's egg.

The metal in this state burnt freely enough, but it contained slight impurities, and demanded further treatment to render it ductile and malleable. Again Sonstadt set to work, and after another arduous series of experiments, devised a process of purification by distillation, which he secured by patent in May, 1863. One of the first lumps of the distilled metal was presented to Professor Faraday at the Royal Institution—the spot where magnesium was first introduced to human knowledge. "This is indeed a triumph!" exclaimed the great philosopher as he poised the shining mass in his hand.

Not yet, however, had the time arrived for working magnesium on a commercial scale. Many details had to be brought still nearer practical perfection, and the Summer and Autumn of 1863 were consumed in experiments. At last, with the close of the year, Mr. Sonstadt considered it safe to commence manufacturing. The Magnesium Metal Company was organized, and operations commenced in Manchester.

The aim with which Mr. Sonstadt set out was a ready method for the extraction of magnesium from its ore, and his merit is to be measured by its achievement. The methods of his predecessors were only practicable in the laboratory, indeed they made no pretence to practice elsewhere; they required complicated apparatus and delicate manipulation, and, with all care, frequently resulted in failure. His method, on the contrary, is so simple, that it can be accomplished by the hands of ordinary workmen, and on a scale only limited by the convenient size of vessels and furnaces. At Loughborough, at Midsummer, 1863, we saw some pounds of magnesium made by a labourer and his boy with perfect

The manufacture of magnesium, as conducted in Manchester, may be conveniently described under three heads:—I. The preparation of anhydrous chloride of magnesium. II. The release of the magnesium from the chloride. III. The purification of the magnesium by distillation.

I. Lumps of rock-magnesia (carbonate of magnesia) are placed in large jars and saturated with hydro-chloric acid. Chemical action at once ensues; the union of carbon and oxygen with magnesium in the rock is dissolved; the magnesium combines with the chlorine of the acid, forming the desired product—chloride of magnesium, but in solution.

The water is next evaporated from the salt. The

liquor is poured into broad open pans, which are placed over stoves. When the drying is sufficiently advanced, the salt is collected into a crucible and subjected to heat until perfectly melted and the last traces of water driven off, when it is stowed away in air tight vessels.

II. In the second stage, that curious metal, sodium, used likewise in the reduction of aluminium, comes into play. Common table salt is sodium *plus* chlorine—released from chlorine we have sodium. It is a white metal, but quickly grows dim on exposure to the moisture of the atmosphere. If cast upon water it floats and burns fiercely, almost like potassium. Such is its affinity for oxygen, that it has to be kept in air-tight vessels or under oil. It may be cut with a knife somewhat like tough cheese.

In a crucible are deposited five parts of the dry chloride of magnesium with one part of sodium. The crucible is covered and heated to redness, when the chlorine deserts the magnesium and flies over to the sodium. The crucible is allowed to cool and its contents removed in block, which when broken up reveals magnesium in nuggets of various sizes and shapes, like eggs, nuts, buttons, and minute granules. This product is styled crude magnesium.

III. The distillation of the crude magnesium is effected in a crucible through which a tube ascends to within an inch of the lid. The tube opens at the bottom into an iron box placed beneath the bars of the furnace, so that it may be kept cool. The crucible is filled with the crude metal to the level of the mouth of the tube, the lid is carefully luted down, and the atmospheric air expelled by the introduction of hydrogen. As the crucible becomes heated, the magnesium rises in vapour freed from any impurities, and descends through the upright tube in the centre into the box below, where, on the completion of the operation, it is found in the form of a mountain of drippings. It is subsequently melted and cast into ingots, or into any other form that may be desired.

In this broad sketch of the process of manufacture, the reader will perceive how fully Mr. Sonstadt's ideal has been realized. Scarcely a month elapses in which some detail is not reduced to greater simplicity and some new economy discovered in the works of the Magnesium Metal Company. The new art has made great progress since its establishment; experience suggests constant improvements.

When the Magnesium Company commenced manufacturing, the question presented itself, In what form should the metal be offered to the public? As there was no known use for it except as a light, it was determined to vend it in the form of wire; but here arose a difficulty—How to make wire. The metal was not ductile, and could not, like iron or copper, be drawn out. Dr. Matthiessen and others had pressed small quantities into wire, but when experiments were made on a large scale, the magnesium was found capricious; sometimes it worked readily, but at others it resisted enormous pressure, and the rams broke down under the strain. Mr. William Mather, of Salford, had taken the matter in hand, and with admirable resolution declined to be baffled; through costly disasters he persevered, tried, and tried again, and finally overcame. Now, by machinery of his contrivance, the metal is pressed into wire of various thickness, and a spectator might wonder as the silver threads stream forth, how that which now seems so easy should have cost such pains. Mr. Mather improved on the wire by flattening it into ribbons, in which form, as a larger surface is exposed to the air, combustion takes place more completely. Mr. Mather likewise made the first lamp for burning magnesium. In it the end of the wire or ribbon was presented to the flame of a spirit-lamp to ensure perfect combustion. As the wire burnt it was paid out by hand from a reel, and propelled between rollers through a tube, which conducted it to the flame. A concave reflector diffused the light forwards, and afforded shade to the eyes of the operator.

To few could the introduction of the new metal to commerce yield such lively satisfaction as Professor Roscoe, whose hint had been, as it were, the spark which set Mr. Sonstadt's energy afire. It was Dr. Roscoe's lot, moreover, to introduce magnesium to the scientific public. In doing so he was fortunate in having the assistance of Mr. Brothers, of Manchester, who, in the Spring of 1864, was the first to take a photograph by the magnesium light. At the Royal Institution in May last year, Professor Roscoe delivered a lecture on Light, and among his illustrative experiments, burned some magnesium, and calling forth Professor Faraday from the audience, had him photographed on the spot by Mr. Brothers, and the negative being inserted in the magic lantern, a gigantic likeness of the venerable savan was projected on the screen. The same experiment was repeated, with Sir Charles Lyell for a subject, in the Bath Theatre, when Professor Roscoe lectured on Light to one of the evening assemblies of the British Association.

To photographers the magnesium light will prove an inestimable advantage. Smoke, fog, and night need no longer interfere with their operations. A busy man, who cannot afford to lose a forenoon in order to catch the sunshine, may have his likeness taken in the quiet and leisure of an evening at home. Photographs under such circumstances are much more likely to possess that ease and naturalness which are so difficult to attain under the ordinary conditions of out-of-door costume, an ascent to a house-top by a tedious flight of stairs, and a pose in the glare of a glass-house amid theatrical furniture. As a Quarterly Reviewer observes:—

"The new magnesium light promises to dispense with the necessity of a glass studio with all its discomfort for the sitter, and all the temptation to meretricious decoration which it appears to hold out to the photographer. The metal magnesium, the oxide and carbonate of which is a familiar medicine, is itself rare. It will burn like a candle,\* and it emits a light peculiar for its wonderful richness in chemical rays; but until recently the cost of isolating it has been so great, that its capabilities have never advanced beyond the rank of a chemical curiosity. Recent discoveries have, however, facilitated its manufacture, and it has come into partial use among photographers. A slight further reduction in cost† [a reduction which has been made since this was written] "will enable photographers to use it for the purpose of taking likenesses in the houses of their sitters; and the sitter's gain in personal comfort will be duly registered in the improved expression of the picture."‡

Nor are portraits taken by magnesium light in any sense makeshifts. It is quite within the truth to say, that they are equal to, and undistinguishable from, sun-pictures. Of course the skilful handling of the new light is only to be acquired after some practice.

The light will probably develop a melancholy branch of art—the portraiture of the dead. We say melancholy, but more in a conventional than a sincere sense. The faces of the dead frequently assume a sweet, a saintly, a severe, a statuesque beauty rarely present in life. By the aid of magnesium this beauty may readily be perpetuated, and divested of painful accessories. Some such memorials we have seen, and they have only to be known to become common.

As soon as it was discovered that photography was possible by magnesium, it was suggested that the interiors of the pyramids, of catacombs, caves, and other underground and dim regions might be revealed in faithful pictures, and studied under the stereoscope. The suggestion was soon acted upon. Professor Piazzi Smyth, the Scottish Astronomer-Royal, having gone upon an exploring expedition to the pyramids, took

with him a quantity of magnesium wire, and thus reports on its use to his friend Mr. Spiller, of Woolwich Arsenal:—\*

"East Tomb, Great Pyramid, Feb. 2, 1865.

"My Dear Sir,—We have been here now about three weeks, and are settled down at last to the measuring; the chief part of the time hitherto having been occupied, in concert with a party of labourers furnished by the Egyptian government, in clearing away rubbish from important parts of the interior, and in cleansing and preparing it for nice observation. The magnesium wire light is something astounding in its power of illuminating difficult places. With any number of wax candles which we have yet taken into either the king's chamber or the grand gallery, the impression left on the mind is merely seeing the candles, and whatever is very close to them, so that you have small idea whether you are in a palace or a cottage; but burn a triple strand of magnesium wire and in a moment you see the whole apartment and appreciate the grandeur of its size and the beauty of its proportions. This effect, so admirably complete, too, as it is, and perfect in its way, probably results from the extraordinary intensity of the light, apart from its useful photographic property, for, side by side with the magnesium light, the wax candle flame looked not much brighter than the red granite of the walls of the room. There come parties—often many parties—of visitors to see the pyramid every day without fail, and they come amply provided, too, with all sorts of means and appliances to enjoy the sight, i.e., with everything but the needful magnesium wire; and one waistcoat pocket full of that would be worth a whole donkey-load of what they do bring up to enable their souls to realise the ancient glories of the internal scene.

"I remain, yours very truly,

"C. PIAZZI SMYTH.

"John Spiller, Esq., Chemical Department,  
"Royal Arsenal, Woolwich."

M. Nadar is said to be engaged on a series of photographs of the catacombs of Paris; various artists are busy practising on monuments in obscure recesses of Continental churches; and Mr. Brothers, we believe, contemplates undertaking the caves of Derbyshire. The crypt of Stephen in the Palace of Westminster, recently restored and decorated under the direction of Mr. E. M. Barry, has been lighted up for an hour and a half with the magnesium lamp, and the exquisite elaboration of its moulded and carved doorways and the bosses of the groining displayed in vivid detail. By the same means the vast recesses of the Outfall Sewer Works at Crossness have been illuminated.

In surgery the magnesium light is now freely used in examinations with the speculum. In a recent number of *Galignani* we read—

"This powerful light has just received a new application in connexion with the laryngoscope, a small apparatus consisting of two mirrors, by means of which the lower parts of the larynx may be conveniently brought to view. M. Maisonneuve, being desirous of showing his students the manner of using this apparatus, requested Dr. Fournié, the inventor of the improvement we are about to describe, to attend a late clinical lecture of his. Dr. Fournié did so, bringing a patient with him who was suffering from a polypus situated deep in the throat. This tumour, of the size of a fibert, not only impeded the free articulation of sound, but might in the end, by its growth, have rendered respiration impossible, and consequently caused death by suffocation. In order to render this pathological phenomenon visible to the students and physicians who crowded the lecture room, M. Fournié made use of the magnesium light. By means of M. Mathieu-Plessy's lamp, specially constructed for the magnesium light, strong luminous rays were projected on the mirror placed at the furthest end of the fauces, and thence

\* No: not quite like a candle. Magnesium wire should be held downwards, say at an angle of 45° in burning. No more than a paper spill or a wood match will magnesium burn with certainty if the lighted end be held upright.

† Article "Photography" in *The Quarterly Review* for October, 1864, page 517.

\* From the *Athenæum*, No. 1948, 25th February, 1865.

reflected into the larynx and the trachea. These parts being thus powerfully illuminated, were visibly depicted on the mirror; but the image was necessarily small, the mirror not being more than two centimetres square. But on a bi-convex lens being placed before the patient's mouth, the image became so enlarged, that every one could distinguish it from a distance of a few metres. These two applications of important scientific discoveries and contrivances combined are highly interesting; in the first place, by the aid of the magnesium light, the exact site of the slightest sore in the respiratory organs may be discovered by physicians; and in the second place, the same may be rendered visible to a numerous audience."

One of the peculiarities of the magnesium light is, that it displays colour as in sunshine. This may be tested, and a very interesting effect produced, by burning some wire in a garden or conservatory at night. This peculiarity we learn from the *British Journal of Photography* is being turned to practical account:—

"The magnesium lamp promises quickly to become a regular article of furniture in every silk mercer's show-room. A dyer, of Paris, some months ago, saw the magnesium light for the first time, and discovering at once that its rays left colours unaffected, exclaimed, 'This is just what we have long wanted.' Even in Paris there are many days in winter when those who deal with delicate shades of colour are utterly at a loss to discriminate between tint and tint, but the magnesium light has completely removed the difficulty. Now, whether it be fog or night, any question as to colour is in a moment set at rest in the flame of a bit of magnesium wire."

The strength of the magnesium light, coupled with its easy production qualifies it for extensive employment in commerce and war. Unlike the electric and oxyhydrogen lights it involves no cumbrous and troublesome apparatus. With a coil of the wire in his waistcoat pocket, and a few matches, an Alpine explorer has instant means for making his whereabouts known at night. The light has been seen at a distance of twenty-eight miles at sea; how much further remains to be determined. Commissions under several governments are investigating its capabilities, and there is reason to believe that it will very soon be adopted for ship signals and in lighthouses. It has been suggested that rockets primed with magnesium in powder and thrown up at uncertain intervals would effectually prevent a night surprise, as they would light up the country for miles around. By the same means many of the secrets of an enemy's position might be discovered. Had the United States' navy possessed the light sooner, the hazards of blockade-running would have been indefinitely increased. Its merits were only revealed when the opportunities for its employment were passing away. We read in the *Times* of 20th February of the present year (1865):—

"It appears that, according to Federal anticipations, blockade-running is likely to suffer a check by the introduction into the American navy of the new magnesium light, of which metal the Washington government has ordered a supply. Several of the European governments, it is also said, are engaged in experiments with a view to its adaptation to lighthouses and coast and sea signals."

An American Magnesium Company has been formed to work Sonstadt's patents in Boston; and it will be singular if that enterprise, ingenuity, and fertility of resource, which have placed the name of New England in the highest rank in the arts alike of peace and war, do not quickly surprise us with some bold applications of the metal.

It is hardly necessary to describe magnesium. In wire or ribbon it has become a common object in shop windows. It is white—brilliant as silver when pure and clean. In dry air it preserves its lustre, but in moisture it oxidizes and gets dull as zinc. Its specific gravity is 1.75, or about one-fifth that of copper, which is 8.95. Aluminium is a very light metal, but its

specific gravity is 2.56—much denser than magnesium. Silver is 10.50; an ounce of magnesium is, therefore, six times the bulk of an ounce of silver.

We have confined ourselves to magnesium as a light-giver. That use has been so obvious, and pregnant with so many advantages, that it has absorbed all attention; but it is scarcely probable that magnesium will continue to be made for burning only. It has surely other merits; but much, very much, remains to be learnt about it. What is its value as a conductor of electricity? Under what conditions is it ductile?—under what fragile? What is the degree of its tenacity—its strength under tension? What is its specific heat? What are the characters of its alloys?—these and scores of other questions have yet to be answered with scientific precision.

People are constantly drawing conclusions from the present price of Magnesium. Reasoners were last summer deciding that this and that could never be done because it was selling in wire at 3d. per foot. Now that it is selling at 1d. where are their conclusions? Arguments from such premises are idle. No one can tell at what price magnesium may be produced. Many improvements in the processes of production have been effected since the Magnesium Company commenced working, and their experience will beget others; their art is young—not yet two years old. Price, moreover, is largely dependent on the scale of production. If iron was worked on the present scale of magnesium at what price would iron wire be retailed per foot? Whenever magnesium is demanded in large quantities its price will fall. The Magnesium Company look wistfully for great consumers, for various economies at their command are only practicable on extensive plans. They could, and they desire earnestly to, produce cheaply; they only await opportunity. Dr. Percy informs us that no one need think of smelting copper with less capital than £50,000; the requisite economies are impossible on smaller means. Should magnesium ever be used as freely as copper, who can predict what may be its price?

**22 JOHNSON & SONS, 18a Basinghall st. London.**—Nitrates of silver and uranium; chloride of gold prepared for photography; nitrate of silver, sticks and points for surgeons; crucibles, dishes, &c., of platinum and silver; magnesium wire for illuminating purposes; refined antimony, bismuth, cadmium, and tin.

**23 KANE, W. J. & SON, 54 North Wall quay, Dublin.**—Sulphate of soda; sulphuric and other acids.

**24 LEWIS, F. 6 Fleet st. Dublin.**—Perfumery, and articles for the toilet; writing and marking inks.—(Nare).

**25 MACKAY, J. W. 40 Westmoreland st. Dublin.**—Manures, raw materials used in the manufacture thereof.—(Agricultural Hall, Kildare st.)

**26 M'MASTER & HODGSON, Ashtown Oil Mills, Phoenix Park, Dublin.**—Rape oil; rape cake and meal; linseed oil; linseed cake and meal; Irish rape and flax seeds, from which they are manufactured.

As Ireland promises to become a renowned flax-growing country, there is a prospect for oil crushers in that country which has never hitherto been presented.

The Ashtown Mills were built by Messrs. M'Garry and Sons, under the superintendence of Mr. Robert M'Garry, the present manager of the works, in the year 1831. At that time the M'Garrys owned 130 acres of the adjoining land, and probably cultivated the seed crushed at their mill. At any rate, they were well known for their endeavours to develop the natural resources of their country; for in addition to their extensive farming operations, they established lead mines at Clontarf, which, for want of the immense capital required for such operations, were closed many years since. The Ashtown Oil Mills, after having been successfully worked for over thirty years by the founder and his sons, passed a short time since into the hands of the present owners—Messrs. M'Master and Hodgson, the old established and well-known druggists and general merchants of Dublin.

Arrived at the mills, which adjoin the Park on the north side, we take an external survey of the buildings, which are ordinary, good-sized, substantial affairs, with walls four feet thick, of stone so close grained and durable that it appears likely to serve the purposes of many succeeding M'Masters and Hodgsons, even should the present ones hold it until they are as aged as the patriarchs. A water-course has been cut from the Royal Canal, with a pond and mill-race, and a fall of 18 feet upon an immense wheel, 28 feet in diameter and 10 feet wide, which, without ceasing day or night, turns monotonously upon its axle for the good of the oil trade and consumers of oil, oil-cake, and linseed and rape-meal. The stream of water that supplies so much power to the machinery within, having performed its important task, enters an arched channel, and listlessly returns to its original source through a "tail race" about 1,200 feet long.

We notice that the buildings are well arranged, and that in their erection economy of space and the comfort of the work-people have been well studied. The present works cover three acres of land, and clearances are being made for additional buildings.

Entering a good sized room, we observed several men emptying sack after sack of linseed into an immense funnel-like wooden vessel that appears to engulf all with extraordinary rapidity, and gape for more. This is called the "hopper;" it has the assistance of an "elevator," consisting of an endless band of leather, supplied at intervals of one foot with buckets, which, as the belt revolves, dip into the mass of seed, and carry it aloft. The motion of the belt is so rapid that the little buckets, on reaching the top cylinder, pitch out their burden to a considerable distance from the shaft which, through a height of five extensive floors, protects the belt. It will be wondered how so much seed can be carried away in so short a time by vessels holding only about seven pounds each; but there are 200 of them, and they never cease to ascend and descend in rapid succession. This is the process adopted for storing the grain on the various lofts, which is considered a much easier method than hoisting sacks with a crane. For those who are fond of familiar comparisons, we may add that the belt and buckets are on the same principle as those used on board mud-barges to clear the beds of foul rivers. In the absence of home-grown linseed, Dutch and Bombay seeds are used, the two kinds being mixed together. The home grown seed is, however, preferred; for it is brought to the mill in a fresh state, while that from abroad is chiefly what is left after sowing.

Immense quantities of seed having been stored on the various floors, it is conducted back again to the ground floor—as required for crushing—by means of wooden shoots. In the first process a small stream falls through the roof between two bright steel rollers placed within one eighth of an inch apart, and revolving towards each other. In passing between these the seed is merely broken, displaying afterwards the rich yellow grain, but little indication of the stores of oil to be extracted from it by future operations. The stream of broken seeds descends upon the floor in one corner, and to this heap a man with a wooden malt shovel makes periodical visits, transferring about six bushels at a time to beneath two pairs of ponderous vertical grinding stones weighing four tons each, and chasing one another upon edge round the metal pan which contains the broken seeds. The grinding soon destroys what remains of the original form and colour of the seeds, for as it changes into a damp, heavy flour, the colour of the mass also undergoes alteration, by the equal mixture of the outer skin and inner germ of the grain. The heap of broken seed is of a brown colour when viewed at the distance of a few feet; but after the same has been submitted to the grinding stones, it has a much lighter yellowish tinge. It is one man's duty to attend to the devouring wants of these enormous stones, and when a "charge" has been sufficiently crushed he "draws" it, and sup-

plies another, without for one moment arresting the progress of the machinery. To effect the first object, a trap-door is taken from the metal pan upon which the stones travel, and a sweeper descends at the will of the attendant, and brushes all the flour into the wake of the hole, while a wooden bar occasionally shifts the mass towards the hole, through which it falls to the floor.

The seed is not allowed much rest in its new condition, but is at once seized by a number of men and boys, who transfer it to the "kettles"—a series of iron vessels holding about two bushels each, and surrounded by a hollow chamber filled with steam from an immense boiler in an adjoining building. Each vessel has a "stirrer," which, being interpreted, means an iron rod with radiating arms, placed in the centre. These rods, being connected with the water power, are kept in constant motion, by which means the contents of each vessel are constantly stirred, and an equal amount of heat imparted to all portions of the meal. The object of this stage in the treatment is to liquify the oil previous to submitting the crushed seed to hydraulic pressure. When made quite hot it runs more freely from the grain than when pressed in a cold state. We keep our eye upon one particular Knight of the Kettle to ascertain by what means he shall repossess himself of the hot contents, and presently we observe him place upon the lips of five mouths, opening at the base of the vessel, as many long, stocking-like worsted bags. He then opens a trap door, and out comes the charge and descends into the bags, which are instantly removed, and the door closed to make room for a repetition of the same programme.

We now come to the fourth and most important stage in the process, and not having yet tired out our patient guide with our very minute examinations and inquiries, we stand with him before one of a number of oil presses, all similar in construction and mode of action. One at a time the workman brings forward the worsted bags, and after manipulating them into an uniform shape—half round and half flat—by sundry vigorous applications of the fist, arm, and elbow, the five are placed between the five divisions of the hydraulic press, which no sooner receives them than it commences an affectionate hug, increasing its intensity by slow degrees until it culminates in the delightful squeeze of 250 tons power.

Along the side of each division that contains a bag run small channels to receive the oil, and a series of pipes placed at the corner convey it away. The first pressure merely flattens the bags, but presently bright drops of oil appear here and there, and fall into the channel; the drops now become more numerous, and after a time all join together and dribble rapidly into the pipes. As the pressure nears its utmost limits, we see the oil gush out in such quantity that we begin to wonder how the small, dry-looking seeds we looked at in the hopper could have contained so much oleaginous liquid. But we have been witnessing the performance of but one-half of the press, which is a double one with alternate action. Another series of five shelves, with oil channels and pipes, alternates in its operations with that just described, and while one is being filled the other is emptied. The bag full of meal having been rendered literally as "flat as a pancake," the press gradually relaxes its hold, and meanwhile the water power transfers its attention to the second series of bags, which is now ready for the squeeze. While this is taking place, we alter our position to the opposite side of the press and watch the men draw out the long cakes of flat, hard, dry, uninteresting looking stuff. The bags are stripped off, and the soft edges of each cake planed on a knife fixed in the front of a wooden bench. The refuse thus accumulated goes through the press again. Upon each cake we find the brand "M. H.," which is impressed by placing a piece of leather inside each bag with the initials cut out with a knife. The usual plan adopted for branding oil-cake is to work the design with worsted upon the bags; Mr. M'Garry has, however,

adopted the simple and much more effective plan of placing the design cut in leather inside the bags.

We must now see what becomes of the oil after it leaves the several presses engaged in expressing it from the seed. Each little pipe from each division of each press communicates with one common channel, which conveys the oil to a monster underground reservoir capable of containing about two tons of oil. The liquid, however, does not remain here long. A force pump, from which numerous pipes proceed to all parts of the premises, conducts it to such places and in such quantities as are required. For the present we will follow those which carry the oil in its raw state to the stores. Here we find in a building about 200 feet long a series of immense tanks, ranging in capacity from 3,500 to 10,000 gallons. From these cisterns the oil is drawn by means of taps into the barrels in which it is sent to our shops. Outside the stores stands an immense pair of scales, and in these the barrels are weighed, and the quantities painted upon them. One of the out-buildings is set apart as a cooperage, and all the barrels used at the mills are made and repaired on the premises.

We next follow the course of a four inch pipe leading from the force-pump to a distance of about thirty yards, and entering the roof of a separate building. This is the boiling house, where "drying" oil is boiled and fined for painters' use. An immense cauldron, holding 1,000 gallons, is filled with the crude oil, which is boiled for about seven hours, and when cold transferred to a sheet iron tank, the necessary purifying agents being added. In this tank there are three taps at different elevations. The oil becoming clear near the surface first, is drawn off, and after a further settling down the second tap is used, and finally the sediment is taken away through a tap in the base of the tank. So much care is not taken with the oil sent out from some mills. Manufacturers are not blind to the fact that the less pure, the more weighty the oil, so that the fining down does not occupy much of their attention. During the boiling the oil is kept in constant agitation by means of a shaft turned by a man, who takes up his position in a sort of pigeon house near the roof, outside the building. This precaution is taken in order that the health of the worker may not be affected by the fumes of the oil. The building is also well ventilated from the roof, and is separated by a distance of about 120 feet from any portion of the building. In case of fire the danger or loss would be confined to the boiling house.

Having traced the production of the oil and oil cake through the various stages of manufacture to its final distribution to the dealer and consumer, we devote half-an-hour to a general survey of the storehouse for the oil cake and the lofts where the raw material is housed. But first we are invited to see the large kiln used for drying rape seed. This is on the same principle as the malting floor of a brewery. Entering a long building of three stories, we are shown piles upon piles of cake ready for the market. The cakes are laid edgewise, and one row is piled above another to the ceiling. Each rank holds about 850 cakes, which are calculated to weigh together one ton. Twelve ranks can be accommodated one on the other, so that each complete pile contains about twelve tons. A clear space is left within a centre archway, into which the waggons and carts are backed for loading; and, as linseed cake is piled at one end and rapeseed cake at the other, both kinds are easily reached. The floors above are similarly occupied, with the exception of a portion set aside for miscellaneous purposes.

Crossing the court-yard once more, we ascend by steep and very greasy steps to the first floor of the main building; and this performance, we find, requires the powers of a mountebank to accomplish with a good grace. Every particle of wood about the immediate neighbourhood of the machine room is so thoroughly saturated with oil that neither the hands nor feet of an inexperienced traveller in those slippery regions will retain their hold. Some portions of the wood-

work, such as the railings to the stairs, are dyed a rich, light, glossy, mahogany colour with the oil, and the explorer must ascend several flights of stairs before he escapes the dangerously smooth and narrow passages. But our devotion to the task we have taken in hand carries us in safety from one floor to another, until we reach the summit of the building, and stand on the fifth loft, where we examine the ponderous wheels of the workmen's clock, with the pulleys and ropes that move a minute hand three feet long round a dial six feet in diameter. On each of the floors nothing is to be seen but enormous heaps of seed, some of them receiving additions from the untiring revolutions of the belt and buckets previously described, and others giving out, through well-contrived shoots, gradual supplies to the machinery below. On the first and principal floor a good sized sifter, worked by the unseen agency that turns the machinery below, suffers the very extreme of nervous agitation. Through this sieve every grain of seed is made to pass before it enters the mill; and the miscellaneous collection of odds and ends it gathers from what previously appeared to us very clean seed, indeed, would astonish any one but those who have become accustomed to the sight. Rope ends, morsels of twine, scraps of correspondence in various languages, pieces of wood, small masses of damaged seed, and dust in abundance. Before commencing our perilous descent, we note down some figures respecting the capacity of the immense rooms we have passed through, and find that they are capable of storing six hundred tons of seed, an amount equal to 10,000 quarters, or 80,000 bushels. We ponder a while to reduce these figures to amounts representing the manufactured article, and the result of our calculations is 500 tons of oil, and 1,200 tons of cake. Of course, these storerooms are not always full; but at the time of our visit there was a very large stock, upon which the workmen were operating most actively.

27 MAWSON & SWAN, *Newcastle-upon-Tyne*.—Photographic collodion, with specimens.

28 THE MARINE SALTS CO. OF IRELAND (LIMITED), *1 South Frederick st., Dublin*.—Kelp; muriate and sulphate of potash; soda salts; iodine; all extracted from seaweed.

Few questions are of more moment than what is the probable quantity of seaweed which may be calculated upon on the Irish coast. It would be impossible to answer this question accurately, but it would be alike impossible by any means within the control of human power to exhaust the supply cast by every tide upon the Irish shores.

Taking the measurement of a line describing the shore and the banks around all the interstices from which the weed is washed on the land, from Valencia (or Dingle Bay) to Carrickfergus, it would measure 1,500 statute miles, on each mile of which no less a quantity, on an average, than 3,600 tons are cast yearly, or 5,250,000 tons in all, to which may be added two to three millions cut weed (mean 2,500,000) or 7,750,000 tons of weed, equal in iodine, bromine, and the more valuable salts to the best weeds of Scotland, but superior to that cast on about 500 miles of coast line from Belfast Lough to Valentia, and which yields on the average about 2,000 tons per mile, or 1,000,000 tons. In the same line might also be had 500,000 tons of cut weed—making in all 9,250,000 tons as the yield in Ireland annually.

The quality of the weed on the east and south-east coast of Ireland is as rich in the more valuable salts as weed is on the average in any part of England. Both English and south-east Irish weeds are quite equal to those of France and Belgium, and very superior to those of Spain. For fertilizing purposes, so long as weed is used in a wet state, it makes very little difference between one kind and another, but when it is subjected to chemical treatment a greater or a lesser quantity, according to the amount present of the ammoniacal salts, may be left in manure; so that, under scientific treatment, the difference is as much in favour

of the west and north-west of Ireland weeds, for manure making, as for any other use.

The seaweeds most plentiful on the Irish coast are *Laminaria digitata* (or sea girdle), and *Laminaria saccharina* (or sweet tangle). These are the richest in the valuable salts, viz.:—Iodine, bromine, chloride of potassium, sulphate of potash, sulphate of soda, chloride of sodium, ammonia, &c. The kind of weed next most plentiful is *Laminaria patulum* (or bull kelpweed); next follow *Fucus vesiculosus* (or bladder-wrack), *Fucus serratus*, and *Fucus nodosus*. In each of these all the above-named salts are present, but the proportions of iodine especially is less than in the sea girdle or sweet tangle weeds. The commercial value of these weeds may be arrived at by a consideration of the number of manufactures their utilization would call into operation.

Iodine, for example, of which there used to be got from seaweed at the rate of from 1½ lb. to 5 lbs. per ton of kelp (but from which, under a new process lately patented, there can be got 18 lbs. to 26 lbs.), would give rise to several chemical manufactures, as well as become a great auxiliary in providing employment for the people near the coast. Iodine, as it is usually extracted, is worth at present 6s. to 8s. per pound; but, if resublimed, would sell for double these rates respectively. Besides, this iodine can also be converted into the various iodides required for pharmaceutical, veterinary, and photographic purposes. Hitherto the only advantages the people have had from the utilization of weed for its salts were the sums made by the persons who burned, or who boiled, and the merchants who bought, the kelp for the Glasgow market. The remainder of the work was done in Glasgow. The amount of labour kelp gave, in proportion to all other chemicals operated on in these great works to which it found its way, was but small, yet it was by no means unimportant. The demand for this one product of Irish seaweed is unlimited. Its supply may be increased extensively without affecting its price in the least. But when the cost of getting it to market in the way now adopted is taken into account (and it pays well), there is obviously most palpable neglect on the part of the Irish people who have not had iodine works on their own coast long ago. Kelp burning has been carried on by the people on the Antrim, the Donegal, and Galway coasts, and on the Arran Islands, in an unsystematic way, for the last ten or fifteen years. Some years large quantities were burnt; in other years the people were timid, and a small quantity was made. But, little or much, it is easily sold at prices varying from £2 to £8 per ton of 22 cwt. 2 qrs. All kelp had to be sent either to Glasgow by ship, or, if to the soap boilers of Dublin and other places, at a great expense for carriage upon what these people did not want. But how great must be the advantages of a process which not only saves all unnecessary cost of transit, but yields in iodine alone five times the quantity got in this country, and three or four times that got in France. Besides, any reform in the mode of treating weed, by which the *debris* (insoluble phosphates) could be kept at home for manure, would be highly important.

But not only for the iodine, and the manufacture which would arise from its conversion at home in its various iodides, but also for the chloride of potassium, and the manufactures its treatment would bring into operation, it becomes a matter of much moment to carry on the whole process, from the gathering of the weed to the production of the most refined commodities, upon the Irish coast. The simplest principles of common sense demand that the bulky article of kelp should not be sent to Glasgow to be reduced to its elements, but that these elements, ready for their various uses, should be made fit for market. Chloride of potassium is used extensively in the manufacture of nitre (saltpetre), which is in large demand at all times. The excitement in the market for this article in times of war does not, as in the case of some commodities, lead to an extraordinary supply which in times of peace cannot be

sold. But, on the contrary, the demand for saltpetre depends to a large extent upon coal-mining, blasting in quarries, and other works, which in times of peace are most energetically prosecuted. Chloride of potassium ranges from £20 to £28 per ton. Sulphate of potash, sulphate of soda, chloride of iodine, and ammonia, would each form the chief element in a separate manufacture.

Each of these could be converted into so many forms, and the existence of manufactures for each would be so powerful in sustaining or attracting other manufactures to any place, that it would be unfair to any less of the manufacture of seaweed than that it might be the means of making several towns in Ireland as famous for chemical works as Glasgow, in Scotland, and Newcastle, in England, are now. Viewed from whatever direction, the utilization of seaweed is a most important matter. The economy of seaweed, especially in the way indicated by the new process referred to, would provide the farmer with large quantities of ammonia. This necessary ingredient, which, in combination with other less valuable elements, gives such value to guano, is so largely present in seaweed, that it could be produced by hundreds of tons annually, and sold in the crude state at prices not more than 40 or 50 per cent. over the cost of high-priced guanos. If even the seaweed, in its wet and bulky condition, could be transferred (as it could not) to every part of the country, the effects of its ammoniacal properties would neither reach the soil to the same extent, nor be proportioned so accurately to the several kinds of soils, as if extracted and used with manures. In order, in this case, to have the aid of chemistry in agriculture, it is necessary to employ capital so that every element, in its most exact proportions to be found in sea plants, may be put into a condition in which it may be brought at once to bear upon the fecundity of the soil. The cessation, therefore, of the kelp-burning, may be as beneficial to the interests of agriculture as it is requisite for the better applications of science, and the more advantageous employment of labour and capital.

By the kelp process, the state of fusion in which it is necessary to keep the weed, as may be seen, requires a heat which dissipates another of the most valuable ingredients in weed—namely, bromine. This is another reason why the mode of operation which lays hold of all the elements presenting themselves in the proportions in which they exist, ought to be performed. Besides, by the new process, the commercial results are such as are likely to lead to the introduction into Ireland of those general chemical works with which the manufacture of the above-named salts must be combined.

But, in addition to all these considerations, the utilization of seaweed presents another and a most valuable aspect—namely, the relation of such parts of its products as sulphate of soda (glauber salts) to soap-boiling. Out of this article caustic leys are mostly made; also, salt cake, or crude carbonate of soda. From chloride of sodium can be obtained (in addition to common salt) bleaching powder, or hydrochloric acid; and from the residue salt cake can also be made. But these articles, however important as the nucleus of several new manufactures, the basis of profits, and the means of calling latent capital into usefulness, are greatly more so as affording employment to labour, skilled and unskilled, and are especially to the advantage of those parts of the country at present whose people are most in need of employment. Nor are these all the elements which these invaluable plants may be made to produce, under the treatment of chemistry. There are several others, such as creosotes and oils of various kinds; but, at first, the extraction of these would not pay.

Ireland possesses, in seaweeds alone, a field for enterprise not to be matched in any other country except Scotland, where weed is also abundant; but even there not excelled. Such are the profits to be derived from the cultivation of this industry, that even if the country were to remain as it is in other respects, by its sea-

weeds alone might Ireland become famous for manufactures. These long-neglected and little understood materials are, however, beginning to attract the notice of more than the few peasants who gather weed for manure.

Of the edible marine plants to be found on the Irish coast, carrageen, or Irish moss, is the most valuable. This is to be had in great abundance. Some of it is gathered, bleached, and sent to the English market. But the quantity gathered, as compared with what is wasted, is exceedingly insignificant. This plant contains iodine also, but only in such proportions as accounts for its peculiarly valuable properties as a jelly, or as food of any kind. Irish moss may be made most useful to invalids. The jelly made from this still despised weed possesses all the valuable properties of animal jellies, along with healing, soothing, and nutritious properties for persons under colds, and of delicate health, which are not to be found in any animal jelly. The article has never yet been fairly treated, for such are its nutritious properties, that, were they fully known, there can be no doubt its use would become general. Irish moss could be used as a substitute for rice, tapioca, sago, and even arrowroot. In this commodity alone a large traffic might be carried on.

Suppose this article were used exclusively for feeding calves, it might be made a valuable commodity of commerce. Because of its great bulk it is an article which, if not sold near the coast, and especially if it has to be sent across the Channel, costs an enormous carriage in proportion to its value. The bulk of a ton weight is no less than that of four to five tons measurement in the way it is usually packed; but, like hops and hay, hydraulic pressure would reduce its size to a reasonable bulk. Irish moss has also been used as a substitute for other more expensive glutinous substances in calico manufacture. In this respect alone its value is very great. It ought, therefore, to receive some more intelligent attention, and we trust the time may soon come when it will be required in Ireland for all purposes for which it is suited.

To any who may be acquainted with marine plants, a visit to the west would be convincing that these are valuable, and may be easily obtained in any quantity requisite for most extensive utilisation. But, if other evidence is required, the best authorities admit that Ireland has a supply, for both quantity and quality, of these resources, such as to excite astonishment at the present neglect of them.—*W. G. Crogg's Industry in Ireland.*

**29 PIESSE & LUBIN, 2 New Bond st. London.**—Odoriferous gums; fragrant woods and plants; perfumery and articles for the toilet.—(*Approach to Carriage Court.*)

**30 PULFORD, G. C. 4 Dowgate hill, Cannon st. London, E.C.**—Magnetic paints.

**31 PRICE'S PATENT CANDLE COMPANY, LIMITED, Belmontine, paraffine, and other candles, and candle Belmont Works, Battersea, London.**—Belmont sperm, material; night lights; glycerine; oils and soap.—(*Nare.*)

**32 RECKITT, I. & SONS, Suffolk lane, London, E.C.**—Diamond black lead.

**33 SIMON, L. Nottingham.**—Bronze powders.

**34 TAYLOR, W. & Co. Leith.**—Composite, stearic acid, and paraffine candles.

**35 TUDOR, S. & W. 17 College hill, London, E.C. and Lead Works, Hull.**—White and red lead; litharge and orange lead.—(*East Gallery of Nare.*)

**36 HUTCHINSON, J. & Co. Widnes, Lancashire, and Lord st. Liverpool.**—Products of alkali manufacture.

**37 PATENT PLUMBAGO CRUCIBLE CO. Battersea Works, London, S.W.**—Plumbago, black-lead, graphite, both in natural and manufactured state; also their uses.

The old mineralogists, misled by its remarkable metallic lustre, placed graphite among the metals, and at the present time there are, doubtless, many persons who accept "black lead" as an appropriate name for this

substance. In most dictionaries graphite is defined as "carburet of iron," in accordance with the opinion formerly held by most chemists that it was a compound of carbon and iron. This definition is now known to be incorrect; for, although iron is generally present in graphite, it must not be regarded as an essential constituent, any more than the silica or alumina which usually accompanies it. The iron, silica, and alumina, when present, are simply in a state of mixture, and not chemically combined.

Plumbago, or, as it is more correctly termed, graphite, is one of the forms of carbon, that Protean element which also occurs native as the sparkling diamond and the black and lustrous anthracite, and which also appears in the familiar shapes of charcoal, coke, and lamp-black. According to Dr. Wood's analysis of a sample of graphite used at these works, it contained upwards of 98 per cent. of pure carbon, the remainder being silica with mere traces of iron and alumina. Few samples have been found to contain less than 95 per cent. The variform character of carbon is exhibited by graphite itself, for it is sometimes crystalline, and sometimes amorphous. The crystallized, or foliated graphite, is found occasionally in six-sided tabular crystals, but commonly in foliated or granular masses. It is chiefly obtained from Ceylon, where it is found imbedded in quartz. It is also found near Moreton Bay, in Australia; and in the States of New York and Massachusetts, and in Siberia. The amorphous graphite is that to which the terms "plumbago" and "black lead" are ordinarily applied. It is much softer than the crystalline graphite, and makes a blacker streak on paper. Formerly it was obtained almost exclusively from Borrowdale, in Cumberland, but the mine there is nearly exhausted, and, we believe, is no longer worked. The bulk of that used at present comes from Germany, principally from Griesbach, near Passau. Both varieties are used in the manufactures of the Company; the crystalline for crucibles, and the amorphous for polishing powders.

In making a tour of inspection of their works we commence at the Receiving stores, where we are shown the stock of raw material, which comprises, probably about 2,000 casks of graphite, each holding from four to five cwt. The heads of a couple of casks are broken open, in order that we may compare the hard iron-grey fragments of the Ceylon graphite with the black, dull, friable lumps of the German variety. A piece of the latter pressed between the finger and thumb seems pleasantly soft, and flattens readily into a lustrous cake. From the stores we pass to the engine-house, to take a peep at the prime mover of the machinery employed in the factory. One horizontal engine of 25 horse power serves to do all the work that does not require skilled hands.

The grinding room contains several mills of different construction for grinding and mixing the materials of which the crucibles are formed. In one corner we see two huge stones chasing one another round a shaft, and pitilessly crushing the hard lumps of dried clay that are thrown in their path. Here we see a powerful mill for grinding the graphite; and here again, an ordinary pug-mill for incorporating the graphite with the clays. When the graphite is reduced to powder, it is conveyed to the upper floor by an endless band-lift, and sifted by a contrivance similar to an ordinary flour-dressing machine. One of these machines is provided with a silk-gauze drum of remarkable fineness, and is reserved for the preparation of plumbago for anti-friction purposes.

Following the graphite to the upper floor, we enter the mixing room, where the most important operation in the crucible manufacture is performed. A number of large bins, each containing a distinct variety of clay in powder, or a certain quality of plumbago, are ranged round the room. Upon the proportion of these several ingredients taken to form the mixture, or "metal" as it is technically termed, the quality of the crucibles depends. The actual proportions of Stourbridge and other

clays used are of course kept secret. The ground graphite having been mixed with the clays, the whole is wetted with a sufficient quantity of water, and allowed to soak for some time. Having been "pugged" in the mill, the tempered "metal" is formed into blocks, and then placed in a store-room, where it is allowed to remain for several weeks.

We now enter the potter's room, where the crucibles are fashioned. This room might be a part of any large pottery, were it not for the funereal hue of everything around. On each side are ranged the lathes or wheels, all driven by steam-power, but resembling in other respects the potter's wheel of the early ages. Let us watch the growth of one large crucible. The "thrower" takes the necessary quantity of "metal" and submits it to the operation of "wedging," which consists of tearing or cutting it into two pieces and striking them together again with great force. This he repeats until the metal becomes perfectly tractable. He then dashes the mass upon the revolving disc of his lathe, and presses it with his wet hands until it assumes an irregular conical form. He then makes it take a variety of forms, with the object of getting rid of all air bubbles. It is impossible to follow the mass through its numerous changes, but suddenly when we least expect it, it takes the shape of the crucible. The shape is very rude at first, but under the skilful hands of the thrower, it soon becomes beautifully symmetrical. A wire guide is fixed at a certain height above, and at a certain distance from, the revolving mass, and to this the thrower gradually brings the edge of the crucible. With this simple guide he can make a dozen pots, resembling each other so perfectly in shape and size, that the most experienced eye can hardly detect any variation in them. The skittle pots are made in precisely the same way, but are contracted at the mouth after the inside has been properly shaped. Many of the fire-resisting goods manufactured by the company are shaped by moulds or by the aid of modelling tools. One of these miscellaneous articles which we see in course of construction is a large bath, five feet long by a foot and a half wide, intended to hold molten zinc. This we are told is for a French order.

We now follow the pots to the drying room. Through the centre of this room the upper part of one of the kilns passes, and the heat, which would otherwise be wasted, is thus applied to a useful purpose. Here we find regiments of pots undergoing the drying process. Many of them have the graceful form of the once-celebrated Picardy pots, and are intended for the French mint. Though unbaked, each article that has remained sufficiently long in the room gives a clear metallic ring when struck. [See Section I., p. 112.]

The kilns are large conical chambers like those of ordinary potteries. The goods to be "fired" are packed in cylindrical cases of fire-clay called "seggars" and these are piled one upon the other in the kiln, like the basaltic columns of Staffa, and are luted closely together. These seggars protect the goods from the action of the air, which at a high temperature would have the effect of whitening the external surface, and so rendering them unsightly. We have the good fortune to be present as the workmen are engaged in emptying a kiln. We see that the crucibles come from their fire clay cases exactly as they are sent out from the works. The absurd practice of giving plumbago crucibles a fictitious polish and smoothness, generally followed by continental makers, is not adopted by this Company.

From the kiln the goods are conveyed to the store-room, or to the packing room if they are to be shipped at once. The goods are nearly always packed in old hogsheds, which are strong, large, cheap, and plentiful. Turning out on to the wharf, we see thirty of these hogsheds packed ready to be shipped for Vienna; and, lying alongside, 150 cases containing crucibles for the Italian Government. These orders, not by any means unusual in magnitude, will enable our readers to form an idea of the scale upon which the operations of the Company are conducted.

We now cross the yard to the workshops of the clay department, where various descriptions of crucibles are manufactured. The larger sizes, as in the case of plumbago crucibles, are made at the potter's wheel, but the smaller, in which the company can successfully compete with the best French makers, are fashioned by beating the clay upon box-wood mandrills. The so-called "white fluxing pots" are really beautiful specimens of earthenware, and are acknowledged by the best authorities on metallurgy to be very refractory, and to withstand the action of fluxes in a most remarkable manner. Every pot is made by gauge, and each moulder is consequently provided with a great number of pattern ribs, cut from boxwood and ebony. The little crucibles used in assaying, almost equal the German porcelain crucibles in thinness and smoothness. The smallest are not much more than an inch high. Besides crucibles, all kinds of clay instruments used in assaying are here manufactured, such as scorifiers, roasting dishes, and muffles. The convenient clay furnaces used by assayers, dentists, and experimental chemists, are also made in great numbers.

Let us now turn back to the store-rooms, and look at a few of the curiosities that are to be found there. We have just been speaking of a crucible about an inch high. Here is one of the patterns supplied to the Royal Mint, intended for melting 600 pounds weight of silver. Here again is another plumbago pot, made specially for zincing the Armstrong shot, and which will hold 800 lbs. of molten zinc. The medium sized plumbago pots, now so extensively employed for melting silver, gold, copper, brass, and malleable iron, are, of course, the most important products of the works. All the pots are numbered according to their contents, each number standing for one kilogramme, or a little over two pounds, thus:—a No. 2 crucible contains two kilogrammes; a No. 3, three kilogrammes; and so on. Covers, stands, and stirrers of plumbago, are kept in stock, with every conceivable article of fire-clay, from the huge glass pot down to the humble fire-ball for the parlour grate.

The graphite imported by the Company is not used solely in the manufacture of melting-pots and metallurgical apparatus. A good proportion of this valuable raw material is prepared for domestic purposes, and sent from the Battersea Works in the form of ordinary "black-lead." As this article is used wherever there is a grate or stove to be kept bright, its annual consumption must be very large. There is no substitute for it—nothing that can be employed in the same way to polish and protect the iron-work of common fire-places.

The various qualities of black-lead which the Company send into the market under different fanciful names are all prepared from graphite or plumbago, and nothing else. The higher qualities are distinguished from the lower by their superior fineness, softness, and lustre; but chemically they are identical. The article sold under the sentimental name of "Servant's Friend," at 28s. per cwt., is quite as pure as the "Prize Medal Lustre," which fetches double the price, or "Halse's Roman Lustre," the best quality of black-lead manufactured by the company. Again, the analytical chemist would fail to detect any essential difference between either of the above-named products and the article labelled "carburet of iron," in the remembrance of the exploded opinion respecting the nature of graphite. How comes it, then, that one quality is so much superior to another? The explanation is simple enough. The difference in the manufactured article may be traced to certain variations in the physical properties of the raw material. Thus one sample of graphite may be soft and lustrous, while another, equally pure, may be hard and dull. The variations are subordinate to the distinction between amorphous and crystallized graphite, to which we have already referred. For making domestic black-lead, the amorphous or soft graphite is almost exclusively used.

The separation of the different qualities of graphite is a labour which demands great experience and judgment,

and can only be successfully performed by the old hands. The best pieces are soft and unctuous, perfectly free from grit, and capable of receiving a very high polish. The worst pieces, technically called "gruffs," are, on the contrary, harsh, gritty, and deficient in lustre. The latter are only employed for making "leads" of the lowest brands. The numerous intermediate qualities are distinguished one from another by characters which are only apparent to the experienced eye.

The manufacture of black-leads includes three distinct operations—grinding, sifting, and packing. At the Battersea Works, the first operation is performed by means of a large mill driven by steam power. The ground "lead" is conveyed by an endless-band elevator, and is then sifted through the finest silk in the simple dressing machine already noticed. The packing is chiefly done by boys, who work with marvellous rapidity. The powdered black-leads are done up in neat packets, in quantities from two ounces upwards; they are also packed in 1 lb. tin canisters and in wood boxes. Papers of various colours are used to form the small packets, so that the different qualities may be readily distinguished.

A paper covered on one side with burnished black lead is employed for wrapping up some of the higher qualities.

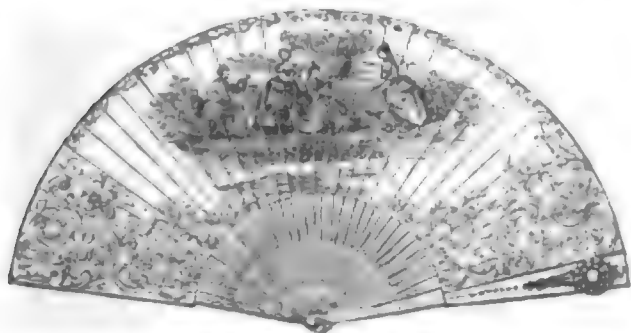
Two descriptions of blocked black-lead are manufactured at the Battersea Works. The blocks are formed by pressing the powdered and sifted graphite into suitable moulds by the aid of machinery, very similar in construction to that employed for making bricks, though of course, on a much smaller scale. There are two blocking machines constantly at work, and the number of little bricks they turn out annually would amply suffice for the building of a Lilliputian city.

99 RIMMEL, EUGENE, 96 Strand, 128 Regent-street, and 24 Cornhill, London; and 17 Boulevard des Italiens, Paris.—Perfumery.—(Approach to Carriage Court.)

The handsome case of Mr. Rimmel was a great source of attraction to ladies, from the various elegant articles of perfumery and toilet applications with which it was furnished. The following are illustrations of a few of the articles shown :—

#### RIMMEL'S PERFUME FOUNTAIN,

As used in the Princess of Wales' Bridal Boudoir. It is easily managed, requires no winding, and can be played with plain or perfumed water.



THE CASSOLETTE FAN,

Delightfully Scented, combining a Fan with a Smelling Bottle. Price, from 3s. 6d. to Ten Guineas.

#### THE FLORA VIENNESE FAN,

Painted on Wood by the best Artists, and Perfumed with different Flowers. This charming and elegant Novelty is made either of white, grey, black, cedar, or rosewood, and has represented on it Flowers, Birds, Animals, &c.



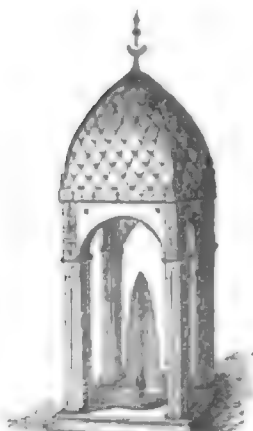
Decorated Coloured Glass, 25 in. by 16 in., £5 10s.



Group of Perfume Vaporizers and Aromatic Disinfectors for Sick Rooms.



Coloured China Figure.  
28 in. by 15 in., £14 14s.



Rimmel's Turkish Fountain, of an entirely novel and elegant design.

These Perfume fountains continue to be very fashionable ornaments for drawing-rooms and boudoirs, as well as for supper and dinner tables.

Few writers have done more to popularize and diffuse instructive information on all that relates to the history and art of Perfumery than Mr. Rimmel has done in papers and essays in the popular periodicals of the day; in lectures before the Society of Arts, Royal Horticultural Society, and other institutions, and especially in his elegant and elaborate work, *The Book of Perfumes*, which goes largely into the history of perfumery and the toilet in all ages and among all nations. To his politeness we are indebted for the following illustrations from his *Book of Perfumes*, and for the very interesting lecture on the commercial uses of Flowers and Plants.

#### ON THE COMMERCIAL USES OF FLOWERS AND PLANTS.

The following lecture, illustrated with practical experiments, was delivered by Mr. Rimmel, before the fellows of the Royal Horticultural Society of London, on the 27th July, 1865.

Flowers are a source of pleasure and gratification to all, be they learned or ignorant: to many they offer particular attractions as an object of cultivation and study; for a few only they possess considerable importance as an article of commerce. The remarks which I shall now have the pleasure of offering will simply bear on the latter point of view.

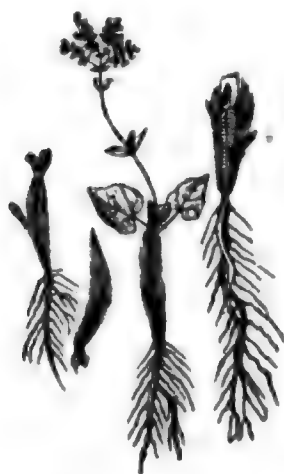
We are all led by a natural instinct to enjoy the pleasant odours diffused by fragrant flowers and plants. The humble floweret which blooms wild on the plain or the mountain, shares, equally with its prouder sister which ornaments our garden, the privilege of embalming the air, and of creating on our minds a cheerful impression. This charm, however, is of short duration; the flower soon fades and droops, the plant dries and sheds its leaves; and were not some means adopted to save its aromatic treasures in all their vitality and strength, we should be, especially in northern climes, entirely deprived of "sweet smells" for many a long dreary month.

To the art of Perfumery we are indebted for reviving,

in the middle of Winter, the enjoyments of the floral season: for, as Shakespeare says:—

"Then were not Summer's distillation left,  
A liquid prisoner pent in walls of glass,  
Beauty's effect with beauty were bereft,  
Nor it, nor no remembrance what it was.  
But flowers distill'd, though they with Winter meet,  
Leese but their show; their substance still lives sweet."

The origin of perfumery, like that of all ancient arts, has been the subject of great controversy. Some assert that its birthplace was Mesopotamia; others Elam or ancient Persia; others again Arabia, which has long enjoyed and still retains the name of the "land of perfumes." It is, however, certain that the first perfumes were obtained by the combustion of aromatic woods and gum (hence the name *per fumum*, "through smoke"), and that the first use primitive nations made of them was to offer them on the altars erected to their gods, perhaps with the mystic idea that their prayers would reach them the sooner being wafted on the blue wreaths of smoke; or for the less poetical purpose of counteracting the smell of the flesh burned in their sacrifices. Modern incense derives its sweet balsamic smell from gum benzoin (*Styrax Benzoin*), which also forms one of the chief ingredients in pastilles and fumigating papers such as are burned in little Parian cottages.

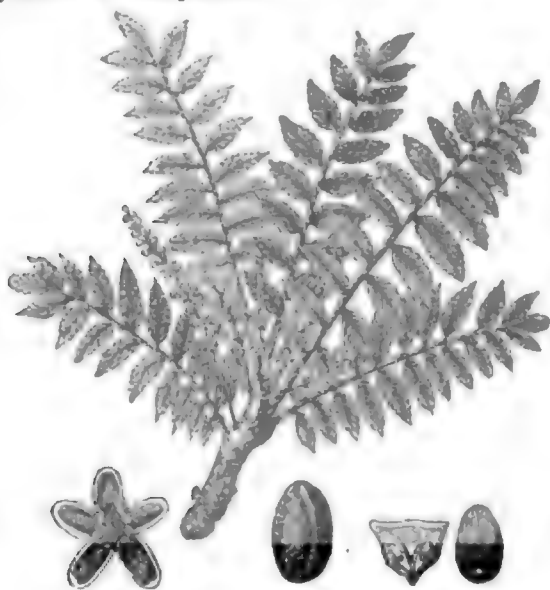


Spikenard  
(*Valeriana Jatamansi*.)

The holy incense mentioned in Exodus as having been prepared by Moses, consisted of equal parts of stacte, onycha, galbanum, and frankincense. Stacte is a kind of myrrh; onycha, the operculum of a shell found in the Red Sea; galbanum, an aromatic balsam; and frankincense, the gum of the *Boswellia thurifera*. I append a list of all the perfumes known and used by the ancient Jews, amongst which is the celebrated spikenard, which Sir W. Jones has proved beyond a doubt to be the *Valeriana Jatamansi*.



The Romans likewise used many perfumes, in the shape of oils, pastes, or powders, with which flowers and plants were incorporated.



Frankincense (*Boswellia thurifera*).

Distillation is supposed to have been invented by Avicenna, an Arabian physician, who flourished in the 11th century, and who was the first to produce that delicious liquid called rose water. I have a Persian Arabic manuscript of the 12th century, treating of medicine and perfumery (at that time combined in one profession), and which contains perhaps the first illustration of a still, which was then of very rude construction.

Some centuries later, as Noorjehan Begum, the favourite wife of Jehan-Geer, was walking in her garden, through which ran a canal of rose water, she remarked a few icy-looking particles floating on the surface; they were carefully gathered, and found to possess an intense and delightful fragrance. This is given by Lieut. Col. Polier as the origin of the far-famed otto of roses, which still sells in India for sixty rupees, or £6 per ounce.

Various ottoes, or essential oils, are now made in India from native fragrant flowers, principally at Ghazepore, on the banks of the Ganges. Besides the rose, they distil several sorts of jasmine, the *kēōrā* or *pandang* (*Pandanus odoratissimus*), the *champāc* (*Michelia Champaca*), the *kurna* (*Phœnix dactylifera*), the *bookool* or *maulsari* (*Mimusops Elengi*), and the blossoms of the *benna* (*Lauronia inermis*), the leaves of which are

largely used by Eastern women for imparting a rosy tint to their fingers, the palms of their hands, and the soles of their feet. These essential oils are made in very primitive clay stills; the distillate is left to stand over night in open vessels, and the oil is skimmed off in the morning. They would be very beautiful if they were not spoiled by the admixture of sandal-wood shavings, which facilitates distillation, but gives them all the same heavy flavour.

There are four means in use among modern European perfumers for extracting the aroma from fragrant substances: distillation, maceration, absorption, and expression.

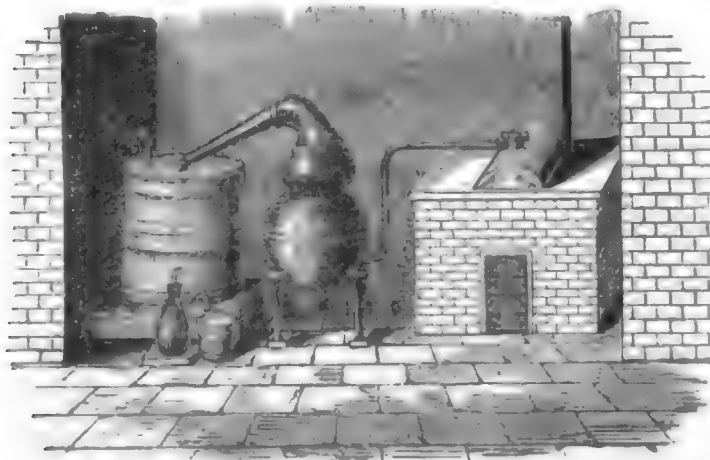
Distillation, which is applied to plants, seeds, barks, woods, and a few flowers, consists, as you all probably know, in placing the substance from which the scent is to be extracted in a copper vessel called a still, with enough water to cover it. Heat is applied, and the steam generated, which is impregnated with the fragrant molecules, passes through the head of the still into the worm, (a coiled pipe placed in a tube where it becomes condensed by means of the surrounding water, which is constantly kept cool) issues in liquid form at the tap, and flows into the recipient. If sufficiently loaded with aroma it then separates into two parts, the most concentrated of which, called the essential oil, collects either on the surface or at the bottom, according to its specific gravity. It is then decanted, and the water used again for distilling, unless it is of sufficient value in itself to be saved, as is the case with rose and orange flower water. The recipient you see here is called a Florentine recipient, from its having been first used at Florence, where flower distilleries still exist. It is constructed in such a way as to allow the water to escape whilst retaining the essential oil.

A great improvement has been lately effected in distillation, which consists in suspending the fragrant substances on a sieve in the still, and causing a jet of steam to pass through. This operation produces a finer essential oil than by allowing the substances to be steeped in water, as it only carries off the most delicate part of the aroma without dissolving the bitter principles frequently residing in the basis.

The fragrant principles of all aromatic plants may be extracted by distillation, in the shape of essential oil; in fact, it exists ready formed in many of them, contained in minute vesicles, as you may see by bruising a thyme or rosemary leaf with the hand. Such is not the case with flowers; the aroma they possess, with a very few exceptions, is so fugitive that it would become destroyed in the process. In that case maceration or absorption is resorted to. Maceration consists in steeping flowers in a bath of hot grease, letting them infuse for some time, and renewing them until the grease is completely saturated. This grease, which is called *pommade*, is then submitted to strong pressure in horse-hair bags.

Oil is also perfumed in the same way, but requires less heat. This process is applied to rose, violet, cassia, jonquil, and orange flowers; but for the more delicate flowers, such as jasmine and tuberose, the absorption or *enfleurage* system is employed. Purified grease is spread in a thin layer on a pane of glass mounted in a wooden frame or *ash*, called *chassis*; fresh flowers are strewed over this grease, and renewed every morning; and at the end of two or three weeks this grease or *pommade* acquires the scent of the flower in a high degree. Perfumed oil is made in the same way by substituting a wire bottom to the frame, and spreading on it a thick cotton cloth, steeped in the finest olive oil, which is pressed out of it after complete saturation. These frames are piled on each other to keep them hermetic.

Monsieur Séméria, of Nice, lately devised an improved sort of frame for the *enfleurage*



Steam Still.







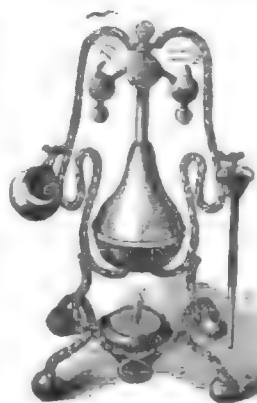
with some means of diffusing the scent of roses throughout that scene. My first answer was that it could not be done, as the various systems for perfuming the air had been hitherto confined to the combustion of aromatic gums and woods, which all gave an incense flavour very unlike roses. On thinking over the matter, however, it struck me that steam, owing to its great power of extension, might be used as a vehicle for carrying fragrant molecules in a rapid and powerful manner through the atmosphere. I constructed an apparatus on this principle, and the experiment succeeded so well that the perfume vaporizer has been used extensively since, not only for scenic effects, but also on a reduced scale in ball rooms, apartments, &c. The peculiar advantage of this system is to give the fragrance of any particular flower in all its purity. Thus, on the day of the marriage of H.R.H. the Prince of Wales, the reception rooms adjoining St George's Chapel, which had been perfumed in that way, breathed an atmosphere of violets, though none were to be seen. The potency of these vapours is so great, that a large theatre like Her Majesty's or Covent Garden is entirely filled with them in five minutes. Now by substituting aromatic plants



Sectional View of Perfume Vaporizer.

for flowers, you produce reviving fumes, which have been thought sufficiently prophylactic to be adopted by the Royal College of Surgeons and several hospitals. The question has been discussed, and not satisfactorily settled, whether these aromatic fumes destroy or only cover unpleasant and deleterious smells; but it is very certain that they render them totally imperceptible, and that is a great point gained. There is a very curious fact connected with these scented vapours, which is that the weakest perfume, such as that of violet, is sufficient to overcome a strong persistent smell like that of tobacco. I have often tried this experiment myself by lighting a small vaporizer in a room where several persons had been or were still smoking, and in the course of a few minutes nothing but the perfume was perceptible. I shall feel much obliged to any scientific man who can explain to me the cause of this phenomenon.

The apparatus usually employed for vaporising perfumes consists in a water bath containing a pan fitted with a bent pipe, the lower end of which is bored with small holes. Perfumed water is placed in the water bath, and the prepared scent in the pan; heat is then applied by means of a spirit lamp, and the steam evolved from the water-bath passes through the pipe into the upper vessel, where it meets with the perfume and



The Revolving Vaporizer.

the apertures and causes it to revolve with great rapidity.

The fourth process I have to describe to you is that of *expression*, which is confined to the fruits of the citrine family, viz, orange (*Citrus Aurantium*), bitter orange (*Citrus Bigaradia*), lemon (*Citrus Medica*), bergamot (*Citrus bergamotta*), cedrat (*Citrus cedra*), and limette (*Citrus Limetta*). The rinds of all these fruits contain an essential oil ready formed in small vesicles, and various means are adopted to extract it. On the coast of Genoa, they rub the fruit against a grated funnel; in Sicily they press the rind in cloth bags; and in Calabria, where the largest quantity is manufactured, they roll the fruit between two bowls, one placed inside the other, the concave part of the lower and the convex part of the upper being armed with sharp spikes. These bowls revolve in a contrary direction, causing the small vesicles on the surface of the fruit to burst and give up the essence they contain, which is afterwards collected with a sponge. The rinds are also sometimes distilled, but the former processes, which are called in French *au zed*, give a much finer essence.



The three principal essences of this kind used are, orange (called also Portugal), lemon, and bergamot, which all enter into the composition of eau de Cologne and many other perfumes. They are made in Calabria and Sicily in the months of October, November, and December, and the quantity of fruits required to make one pound of essential oil varies as follows during that time:—

	October.	November.	December.
Oranges,	1,500	2,000	2,300
Lemons,	1,500	1,800	2,000
Bergamots,	1,800	2,000	2,300

The essence produced by squeezing the rind is yellow; that made with the machine has a green tint: the more or less ripe state of the fruit also influences the colour. The following quantities are produced yearly on an average:—

	lbs.	Fruits.
Orange,	300,000	made with about 540,000,000
Lemon,	500,000	" " 750,000,000
Bergamot,	300,000	" " 600,000,000

Perfumery is not the only use to which aromatic flowers and plants are put; vast quantities are also gathered and sold for medical purposes, especially on the continent.

**39** COLMAN, J. & J. 16 Cannon-street, London, E.C.—Starch, coloured starch, and Indigo blue. (For description, see No. 62, Section III., p. 159.)

**40** BEWLEY, HAMILTON & CO. Sackville st. Dublin.—Pharmaceutical chemicals.

**41** YOUNG, J. Bathgate, N. Br.—Paraffin, and paraffin oil.—(Nare.)

**42** BOILEAU & BOYD, Bride st. Dublin.—Pharmaceutical chemicals.

**828** PATENT PRAT CO. (LIMITED), 84 Middle Abbey-st. Dublin.—Compressed peat fuel.—(Under Verandah.) See No. 821, Section I., p. 111.

**829** PHOSPHO-GUANO CO. 22 Bachelors' walk, Dublin.—Phospho-guano.—(Agricultural Hall, Kildare st.)

**830** GOSSAGE, W. & SONS, Widnes Soapery, near Warrington, Lancashire.—Scented soaps.

**831** RATHBORNE, J. G. 44 Essex st. Dublin.—Unbleached and bleached beeswax; candles, &c.; sperm oil; spermaceti, crude and refined; crystals and candles from same; paraffin, crude and refined; sealing wax, &c.

**832** BICKFORD, SMITH, & CO. Tucking st. Mill, Camborne, Cornwall.—Patent safety fuses.—(Agricultural Hall, Kildare st.)

**833** SEAGRAVE, G. & CO. Hargreaves Buildings, Chapel st. Liverpool, and Seacombe, near Birkenhead.—Phospho-guano.—(Agricultural Hall, Kildare st.)

**834** BRITISH AND FOREIGN SAFETY FUSE CO. Redruth, Cornwall.—Miner's patent safety fuse for blasting.—(Agricultural Hall, Kildare st.)

**835** PATENT WAX-SOAP FACTORY, 8 Bell Isle, York road, King's cross, London.—Bars of soap; patent wax soap; samples of wax; various specimens of materials employed in the manufacture

**836** RUMSEY, W. S., Manufacturing Chemist, 3 Clapham rise, London.—Detergent powders—"Honourable mention" awarded for removing tarnish from dull gold, electro gilt, silver (frosted) articles, jewellery, &c. To be used dry. Improved non-mercurial plate powder, and best rouge for polishing all kinds of plate, &c. Chemical polishing paste for dish covers and all white metals, steel, &c.; urn powder. Rumsey's I X L Jewellery Tablets, for the toilet, in fancy boxes, instantly restores to their original brilliancy all kinds of jewellery, without soiling as rouge and other preparations do.

**837** PARKER, J. W. & CO. Chester, Liverpool, London, and Newcastle-on Tyne.—Lead ore, and products therefrom, viz: white lead; red litharge, and orange lead; white paint; sheet, shot, pipe; silver; block tin; model of shot tower.

#### MEMBERS OF JURY.

J. Apjohn, M.D., F.R.S., &c., Professor of Chemistry, Trinity College, Dublin, *Chairman*.

Thos. Andrews, M.D., F.R.S., Vice Pres. and Professor of Chemistry, Queen's College, Belfast.

Corr-Vandermaeren, Brussels. Commissioner for Belgium.

R. Galloway, F.C.S., Professor of Practical Chemistry, Museum of Irish Industry.

G. Lunge, Ph. D., Manufacturing Chemist, Silesia.

Maxwell Simpson, M.D., F.R.S., &c., Dublin.

W. K. Sullivan, Ph. D., Professor of Chemistry to the Catholic University of Ireland.

C. R. C. Tichborne, F.C.S., F.R.G.S., Chemist to the Apothecaries Hall of Ireland, *Reporter*.

#### JURY REPORT.

To write a similar report to that of "Class II., International Exhibition, London, 1862," would be a superfluous and vain attempt, even if the materials in the hands of the reporter were sufficient. At one time the question was mooted whether this Jury should send in anything further than a simple list of awards; but upon

more matured consideration it was thought desirable that any peculiarities or novelties brought forward should be placed, if possible, in a condensed form before the public, so that the present Exhibition should become, in a degree, a permanent record of industrial progress.

In chemistry proper, the reporter has not much to note as novel. This may be accounted for from the fact that so short a time has elapsed since the last London Exhibition, and also, that there are few of the principal leading products of applied chemistry, viz., sulphuric acid, alkalies, bleaching powder, &c., exhibited. Commercial acids and bleaching powders are shown in the British and Italian departments; but the only exhibitors of soda ash and sodium products are J. Hutchinson & Co., Widnes (United Kingdom, 36), who give specimens of crystals of carbonate and bicarbonate of sodium (the latter pseudomorphs); two specimens of caustic soda fused. These contain 60 and 70 per cent. of soda. The latter may be viewed as nearly pure hydrate, the theoretical quantity being 77.5. Caustic soda may be looked upon as one of those articles but lately introduced into commerce, and yet it bids fair to become one of the most important of the sodium products. The specimens shown by the above firm are examples of the perfection to which any individual article of industry may rise in a short time if there is a demand. Independently of the use of this product by the soap and other manufacturers, there can be no doubt that the late American war, from the restriction it put upon the potassium compounds, gave an impetus to the caustic soda trade. This soda is now largely exported to America and Australia. Messrs. Hutchinson & Co. also show a specimen of precipitated sulphur, procured from the sulphide of calcium of the alkali waste. If they can successfully carry this out, they have solved one of the most difficult problems of the alkali manufacturers. The great weight of the material that has to be handled, combined with the nuisance arising from the working, has been so far a prohibition to the adoption of many of the numerous processes introduced.

In connexion with this class of manufactures we may notice a fine case of platinum stills, syphons, and other apparatus, exhibited by Messrs. Johnson, Matthey, & Co., London (United Kingdom, 21). These articles are all soldered by fusing the seams together, instead of using gold—a more perfect joint is by this means procured, at a less expense. This case raised, some time since, a friendly discussion\* between Messrs. Johnson & Co., and the Reporter, in reference to the substitution of glass for platinum in the concentration of sulphuric acid. The real position, in the opinion of the Reporter, as regards this important point, is, that the advantages and disadvantages are so nearly balanced, that in England, where fuel is not of so much importance, the manufacturers are reverting back to the glass, but that on the continent, fuel being of greater consideration, the platinum still holds its ground, and is likely to do so, from its greater economy in this respect. This firm also shows some specimens of the refractory metals and rare elements, which could hardly have been produced in such quantities had it not been for the experiments of Deville, Debray, and others. Products of the Magnesium Company, Sonstadt's patent, are exhibited by this firm—and as we owe the production of this metal, in a commercial aspect, entirely to the latter gentleman's perseverance, a special medal would have been awarded, but that the rules of the Exhibition Committee prohibit any but exhibitors from receiving medals. Messrs. Johnson and Sons, London (United Kingdom, 22), show a case, perhaps less pretentious, but containing products equally good. Gold, silver, and uranium salts, are also well shown in both these cases.

In iodine and bromine products, Messrs. Tissier and Son (France, 7) show some fine specimens. The iodide of mercury being crystals got by sublimation, instead of the ordinary process of precipitation. The French and

\* *Chemical News*, June 16, and July 7, 1865

German firms had almost entirely the supplying of the British market with bromine until lately; but we find that Mr. Edward Stanford includes this element amongst his products. Mr. Stanford's process for working seaweed is illustrated by a series of specimens exhibited by the British Seaweed Co. (*United Kingdom*, 13). This process, although of modern date, is well known to the chemical public. The systems generally used in working kelp are still of the old crude and primitive style. In most of the methods about one-half of the iodine contained in the seaweed is volatilized. We look upon Mr. Stanford's method as the first one which has been at all successfully worked with a view to prevent this. He incinerates the seaweed enclosed in iron retorts, and by this means saves a large number of bye-products, the result of the destructive distillation of the organic matter. But he also aims at a further yield of the iodine. A glance at the semi-fused lump of kelp in the French department will bring forcibly before us the advantages of this process. Another company, the Marine Salts Co. of Ireland (*United Kingdom*, 28), lately started, also exhibits a series illustrative of a new method of making iodine.

There are not many general collections of chemicals; but one that requires special mention is that of Henner and Co. (*Switzerland*, 1). This comprises technical products, photographic and rare organic chemicals. Some of the latter were examined by one of the Jury (Dr. Maxwell Simpson), and found to be what might be termed very fair commercial specimens. As he remarks, it offers great facilities to original research, that such substances can be procured in quantities, and at reasonable prices. Amylene ( $C_5H_{10}$ ) was one of the products examined. "Almost the entire quantity I took," says Dr. Simpson, "distilled over between  $35^\circ$  to  $45^\circ$  cent. The distillate on being agitated with a solution of chloride of iodine yielded chlor-iodide of amylene ( $C_5H_9ClI$ ), a new body, an account of which has not yet been published. The iodine of allyle ( $C_3H_5I$ ) is also a good product, the greater part distilled over between  $100^\circ$  to  $106^\circ$  Cent.; on being agitated with metallic mercury it became a mass of yellow crystals, the mercurio-iodide of allyle ( $(C_3H_5)_2Hg_2I$ ). The butylic alcohol distilled over between  $104^\circ$  to  $120^\circ$  Cent., and treated with iodine and phosphorus yielded iodide of butyle, the boiling point of which was about  $121^\circ$  Cent." Another case of great interest is that of Dr. Schuchardt, *Silesia* (*Zollverein*, 16). This collection is of a more special character. The contents consist of chemicals used in glass staining. He also exhibits a siccativo, specimens of which are to be found exhibited by Candiani & Co., *Milan* (*Italy* 26). This is borate of manganese, 2 oz. of which are said to render drying 1 cwt. of oil. The last two cases are, in the reporter's opinion especially worthy of note. In connexion with the Zollverein department the watch oils have been individualized by a medal to each exhibitor. Some examined by the reporter were found to consist of pure and very neutral olein. Submitted to a long and continuous temperature of 0 Cent. these oils became viscid, but not the slightest solidification was observed. Lubricating oils for fine machinery, procured from the glycerides, will always be open to the objection that they become rancid upon exposure to air and light, and the Reporter is of opinion that the best oil for these purposes is to be procured from some of the less volatile hydrocarbons, which are the products of distillation of mineral oils.

In the Canadian department we get a specimen of the oil from the mineral springs, exhibited by D. Bogart, *Gaspé* (*Canada*, 5); also a specimen marked cedar oil, which was examined by Professor Jellett, who gives the following account of it:—The specific gravity is .9235. Rotates the plane of polarization of a transmitted ray to the left. Taking the rotary power of American oil of turpentine (which is in an opposite direction) as unity, the rotary power of oil of cedar is 1.2479. In this department chrome yellows are exhibited, procured

from the native chrome iron, considerable quantities of which are found among the mineral riches of Canada.

In the collection of colours, Hare and Co., *Bristol* (*United Kingdom*, 19), carry off the palm by their fine display, in all the gradations of the chromatic scale, viz., shades known under the names of Brunswick green, chrome yellow, Prussian blue, Chinese blue, pure blue, Brunswick and celestial blue, purple, browns, Indian red, and lakes. The specimens of white lead are numerous, and both those of Messrs. Walker, Parker, and Co., *Chester* (*United Kingdom*, 837), and Messrs. S. and W. Tudor, *London* (*United Kingdom*, 35), are excellent. Good specimens will also be found in the Belgian department. There are several second qualities of this article scattered through the building; but according to the analyses made by Professor Galloway, in every case the deteriorations are produced by the admixture of sulphate of barium. In pigments for metal work there is one in the Belgian department which requires a short notice from the fact that the ferruginous pigments are becoming very general. The objection to the old "priming" colour, red lead, is, that for iron work it seems to produce some oxidizing influence upon the surface of the metal. This objection also holds good in connexion with precipitated oxides of iron unless they are very carefully washed. There is a class of ferruginous oxides which consist of burnt ochres, containing a considerable amount of clay, which would interfere very much with the body and protective power of the pigment. The specimens exhibited by De Cartier, *Anderghem* (*Belgium*, 15), under the name of "*Minium de fer d'Anderghem*," seem to possess advantages over the ordinary preparations, as they consist of roasted hematite finely levigated with water.

The candle and soap making trades are well represented in this Exhibition. The British and Irish exhibitors are on the whole very superior to the Foreign and Colonial, both in candles and soaps, and it is perhaps the only branch in this section where any marked superiority is observed. It is evinced both in the appearance and quality, most of the foreign soaps presenting an amount of causticity very undesirable. There are certain names which have become household words, and although so intimately connected with these branches of industry, they seem to the Reporter's mind to embody much more than the name of a successful trader. If such names were merely printed and placed in an industrial exhibition, they would be entitled to the highest honours a jury could give. The Reporter refers to firms that have opened up discoveries and branches of industry entirely new, and after innumerable difficulties have brought the art of their discoveries to the highest state of perfection. We have not a few such exhibitors in this section. First, the firm that trades under the name of "Price's Patent Candle Co." (*United Kingdom*, 31). To this firm we owe the great perfection to which the distillation of glycerides or saponifiable fat is carried, i.e., so as to procure intact the glycerine. Indeed with them, we may say, arose the birth of chemically pure glycerine.

To Mr. Young (*United Kingdom*, 41) we owe the greater part of the supply of paraffine used in this country, procured by the patentee from the Bog Head coal.

The next important exhibitor amongst this class is Mr. Gossage (*United Kingdom*, 836), to whom, independently of the articles he exhibits, we owe many improvements in technical chemistry. His soaps are silicated soaps, namely, soaps containing a certain amount of soluble glass. They are coloured with the aniline dyes. Most of the soaps, British and foreign, were examined in Dr. Apjohn's laboratory.

The following names may be especially mentioned as affording fine specimens of candle manufacturing:—Messrs. J. C. & J. Field, *London* (*United Kingdom*, 17); J. G. Rathborne, *Dublin* (*United Kingdom*, 881); and Messrs. Taylor & Co., *Leith* (*United Kingdom*, 34). Good specimens of naturally bleached wax, and candles

made therefrom, are also shown by Petricioli, of Dalmatia.

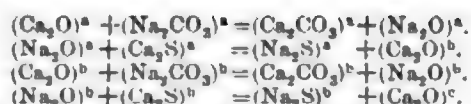
In perfumery, very good articles will be found in the stands of Lewis, *Dublin (United Kingdom, 24)*; Piesse and Lubin, *London (United Kingdom, 29)*; and Rimmel, *London (United Kingdom, 38)*.

Perhaps there is no section that embraces such a mixture of different classes of exhibitors as Section II. One of them is a photographic firm, and as there is a special section for photography, it at first sight might appear strange that they compete in Section II., but they appear as manufacturers of photographic collodions and other chemicals, also as the inventors of a new photographic chemical process. It is with much pleasure that the Reporter is enabled to treat in a few words of the inventions of such importance as are here exhibited by Messrs. Mawson and Swan (*United Kingdom, 27*). There have been two desiderata in connection with photography, each of which has been, from time to time, the *summum bonum* of photographic ambition. One was the printing in carbon, so that the picture might be permanent, and the other the fixing of the natural tints in the picture. The first we may consider as accomplished by Mr. Swan—not only accomplished, but worked out with such results that the most fastidious cannot cavil. This process is based upon the fact that gelatine, containing a small quantity of bichromate of potassium, is rendered insoluble when submitted to the chemical action of the sun's rays. All attempts in this direction had hitherto failed, as no half tones were produced. The specimens shown are beautiful in the extreme. The liability of photographs to fade has tended more than anything else to narrow photography as an industrial art. Messrs. Mawson and Swan also show collodion remarkable for extreme sensitiveness, and yet having been more than six months iodized. They also show collodion for glazing pictures, and for fixing crayon drawings (a new idea). Also a new application of Mr. Wharton Simpson's collodio-chloride of silver for glass printing. Mr. Simpson's original preparation would not do for this purpose, and we believe the preparation shown contains citric acid.

Messrs. Dubosc and Co. (*France, 6*) exhibit some solid extracts evidently prepared with great care. They were found by the Reporter to be perfectly soluble, and to give transparent solutions. These extracts are made for dyeing purposes, and are said by the exhibitors to be used in preference to the woods by many of the Manchester houses.

In Victoria there are exhibited some gums and essential oils, many of them new to British commerce. The peppermint oil, distilled from the plant grown in the colonies, is excellent. The oil of amygdalina odorata, from its price, might be used in perfuming cheap soaps; whilst the kino-like gums from *Eucalyptus rostrata* and *E. amygdalina*, might be used for medical or tanning purposes. The essential oils have been examined, as regards their physical properties, by Dr. Gladstone, vide *Journal of the Chemical Society*, Vol. XVII., p. 1.

In the Italian department we meet some things of great interest. The mannite, or sugar of mushrooms, exhibited by Prof. De Luca, *University of Naples (Italy, 32)*, is procured from the olive tree; also bicarbonate of potassium and sodium, exhibited by Giuseppe Giaranfi (*Italy, 28*), and obtained by submitting crude soda and potash to the action of the carbonic anhydride evolved from the mineral springs of Cinciano. The carbonate of iron shown, as might be imagined, only contained about 10 per cent. of that substance when examined by the Reporter; but the other products are very good. The legitimate application of such carbonic anhydride streams would be to carbonate the liquors in making soda ash, and thus to prevent that source of trouble—the formation of sulphide of sodium by the presence of caustic soda. M. Scheurer Kestner expresses the formation of sulphide of sodium in the black ash residue by the following series of equations:—



The finest starch is exhibited by Messrs. J. and J. Colman (*United Kingdom, 39*), who also introduce a novelty suggested by the Society of Arts, viz., "coloured starches." They consist of rice starch tinted with the aniline colours. Muslin starched with these preparations becomes temporarily dyed, and we believe that the colours are quickly and effectually removed by washing.

The specimens of ethers shown by Messrs. Boileau and Boyd (*United Kingdom, 42*), are very good.

In justice to the other members of the jury, the Reporter is bound to state that, although he thinks he has in most cases conveyed the opinions of his fellow jurors, he alone is responsible for the matter contained in this short *résumé*. He was in hopes that he would have had their advice in the matter; but it was not to be. With one exception, unforeseen circumstances had scattered the workers in Sec. II. in all directions, so that in this respect he was dependent upon the pleasant recollections of their mutual co-operation.

In conclusion, it is necessary to state that the names of many exhibitors of considerable importance have been passed over in silence, in consequence of the short space at the disposal of the Reporter.

CHS. R. C. TICHBORNE.

## LIST OF AWARDS. MEDAL.

### UNITED KINGDOM.

- 11 BARRINGTON, J. & SONS, *Great Britain st. Dublin*.—For the excellent quality of their soap.
- 12 BEWLEY & DRAPER, 23 *Mary st. Dublin*.—For their mineral waters, in Section II.; also for excellence of ginger wine and orange bitters, in Section III.
- 13 BRITISH SEAWEED COMPANY (LIMITED), *White-crook Chemical Works, Dalnair, Dumbartonshire, N.B.*—For series of products illustrating Stanford's patent method of treating seaweed.
- 14 BRYANT & MAY, *Fairfield Works, Bow, London, E.*—For their patent safety matches.
- 17 FIELD, J. C. & J. 36 *Upper Marsh, Lambeth, London, S.*—For manufacture of soap and paraffin candles.
- 19 HARR, J. & Co. *Temple Gate, Bristol*.—For collection of painters' colours.
- 20 HIRST, BROOKE, & TOMLINSON, *Bishopgate st. Leeds*.—For products of the destructive distillation of wood.
- 21 JOHNSON, MATTHEY, & Co. *Hatton Garden, London, E.C.*—For platinum apparatus of various kinds, and salts for photography.
- 22 JOHNSON & SONS, 18A *Basinghall st. London, E.C.*—For the exhibition of various metals and their salts.
- 24 LEWIS, F. 6 *Fleet st. Dublin*.—For general excellence of toilet soap and perfumery.
- 27 MAWSON & SWAN, *Newcastle-upon-Tyne*.—For photographic collodion.
- 29 PIESSE & LUBIN, 2 *New Bond st. London*.—For perfumery.
- 31 PRICE'S PATENT CANDLE COMPANY, LIMITED, *Belmont Works, Battersea, London, S.W.*—For glycerine and candles.
- 32 RECKITT, I. & SONS, *Suffolk lane, London, E.C.*—For superior black lead.
- 34 TAYLOR, W. & Co. *Leith*.—For composite, stearic, and paraffine candles.
- 35 TUDOR, S. & W. 17 *College hill, London, E.C.*—For white lead and other preparations of the same metal.

38 HUTCHINSON, J. & Co. *Widnes, Lancashire, and Lord st. Liverpool.*—For products of alkali manufacture.

38 RIMMEL, E. *Strand, and Regent st. London.*—For superior perfumery.

39 COLMAN, J. & J. *26 Cannon st. London, E.C.*—For superior starch from rice, and for coloured starches, in Section II.; also for excellent quality, purity, colour, and flavour of mustard, in Section III.

41 YOUNG, J. *Bathgate, N.B.*—For paraffin, and for paraffin oil.

821 PATENT PEAT CO. (LIMITED) *84 Middle Abbey st. Dublin.*—For method of compressing peat, and the product of the process.

830 GOSSAGE, W. & SONS, *Widnes Soapery, near Warrington, Lancashire.*—For the good quality of their soap.

831 RATHBORNE, J. G. *44 Essex st. Dublin.*—For superior wax and sperm candles.

832 BICKFORD, SMITH, & Co. *Tucking st. Mill, Cambridge, Cornwall.*—For patent safety fuses.

834 BRITISH AND FOREIGN SAFETY FUSE CO. *Redruth, Cornwall.*—For miners' patent safety fuses.

837 WALKER, PARKER, & Co. *Chester.*—For white and red lead.

28 MARINE SALTS CO. OF IRELAND, *1 South Frederick st. Dublin.*—For iodine and other products from seaweed, illustrating their new process of manufacture.

#### CANADA.

5 BOGART, D. *Gaspé.*—For petroleum oil discovered by him in Lower Canada.

6 LINSEED OIL CO., *Toronto.*—For linseed oil and collection of pigments.

11 PETRIE, STROWGER, & Co. *Newcastle.*—For superior wheat and potato starch.

Foss, S. J. *Sherbrooke.*—For cedar oil, as a substitute for oil of turpentine.

6B LYMAN, CLARE, & Co. *Montreal.*—For drying oils.

#### INDIA.

LAHORE CENTRAL MUSEUM.—For sundry valuable specimens of native and manufactured chemical substances.

#### VICTORIA.

3 & 37 HOOD & Co. *Melbourne.*—For superior collection of chemicals, and for soap preparation for sheep washing.

30 BOARDMAN, P. *Nunawading.*—For collection of essential oils.

31 BOSISTO, J. *Richmond.*—For collection of essential oils.

38 HOBSON'S BAY SOAP AND CANDLE CO. *Melbourne.*—For superior soap and tallow.

42 SLATER, W. H. *Nunawading.*—For collection of essential oils.

#### AUSTRIA.

1 PETRICIOLI, S. (the heirs of), *Zara, Dalmatia.*—For excellence of their bleached wax, and wax candles.

3 LOHNERT, R. *Böhmisch Leipa, Bohemia.*—For dextrin.

59 FUERTH, B. *Schattenhofen, Bohemia.*—For excellence and variety of lucifer matches.

#### BELGIUM.

13 BRASSEUR, E. *Ghent.*—For white lead and ultramarine.

14 BRUNEL & Co. *Ghent.*—For products of the destructive distillation of wood.

15 DE CARTIER, A. *Anderghem, near Brussels.*—For iron minium prepared from brown hematite.

16 DELMOTTE-HOOREMAN, C. *Mariakerke, near Ghent.*—For white lead.

19 MERTENS, B. & Co. *Lesnines, Prov. of Hainaut.*—For lucifer matches.

20 MERTENS, G. *Overboelaere, near Grammont.*—For lucifer matches and blacking.

21 Remy & Co. *Louvain.*—For rice starch of superior quality.

22 SEGHERS, B. *Ghent.*—For bone black.

24 VAN GELTERUYEN-EVERAERT, J. C. & SISTER, *Hamme, near Termonde.*—For starch prepared from damaged wheat.

#### FRANCE.

5 BAUDISSON & HOUZE, J. *Reims (Marne).*—For chemical products.

6 DUBOSC, E. & Co. *Hydre.*—For solid and liquid extracts for dyeing and printing.

7 TISSIER & SON, *Conquet (Finistere).*—For chemical products from sea-weed.

8 ROCQUES & BOURGEOIS, *Ivry (Seine).*—For chemical products.

#### ITALY.

22 ANTONINO, BARON CHRISTOFORO, *Scordia (Catania).*—For essential oils.

26 CANDIANI & Co. *3052 Borgo S. Vincenzo in Prato, Milan.*—For chemical products.

27 CATANIA SUB-COMMITTEE FOR THE DUBLIN INTERNATIONAL EXHIBITION.—For liquorice and certain chemical products in Section II. Also for a fine collection of cottons in Section IV.

28 CIABANFI, GIUSEPPE, *Florence*, and CONVENT OF THE SERVITE FRIARS, *Sienna.*—For bicarbonates, prepared from the carbonic acid of the mineral springs of Cinciano.

30 CONSANI, ERMOLAO DI R. *Leghorn.*—For collection of pigments.

32 DE LUCA, PROF. SEBASTIANO, *Royal University, Naples.*—For manito, extracted from different parts of the olive tree at various stages of its growth.

34 KERNOT, GIUSEPPE, *14 strada S. Carlo, Naples.*—For pharmaceutical products and essences.

35 MELISARI, SAVERIO & Co. *Reggio (Calabria Ulteriore I.).*—For various essences.

38 MESSEDAGLIA, DOMENICO, *Brescia.*—For mineralized anatomical preparations.

39 PARENTI, GALGANO, *Sienna.*—For rare chemicals.

41 RANIERI, PROF. ANGELO, *19 strada della Pace, a Chiaja, Naples.*—For best and common sea salt, prepared by the aid of volcanic heat.

15 SARDINIAN SALT WORKS Co. *Genoa.*—For common and other salts prepared from sea water.

206 SERVENTI, SANTE (Heirs of), *Parma.*—For wax candles and crude wax.

#### NETHERLANDS.

2 SANDERS & Co. *Leyden.*—For hard and soft soaps.

5 VRIESENDORP & ZOON, *Dordrecht.*—Varnishes, stand oil, &c.

6 BAX, G. *Rotterdam.*—For superior rape oil.

16G GARANCINE & Madder MANUFACTORY, *Tiel.*—For garancine and other products of madder.

18 GROOTER, BROS. D. & M. *Westzaan.*—For blues.

#### ROME.

6 THE BOARD OF COMMERCE, FINE ARTS, AND PUBLIC WORKS.—For decorated candle.

7 CASTRALL, GIOVANNI BATTISTA.—For wax candles.

#### SWITZERLAND.

1 HENNER & Co. *Wyl, St. Gall.*—For a very excellent collection of rare chemicals, including, also, pharmaceutic and photographic preparations.

2 LÖTSCHER, BRO., *Marbach, Lucerne*.—For a fine specimen of sugar of milk.

#### ZOLLVEREIN.

16 SCHUCHARDT, TH. *Muskau, Silesia*.—For an excellent collection of chemical preparations.

19 CUNTZE, E. *Cologne, R.P.*—For chronometer oil.

21 CUNTZE, H. WIDOW, *Aachen, R.P.*—For oil for watches.

107 ECKERT, W. & Co. *Frankfort-on-the-Maine*.—For iodized cigars.

#### HONOURABLE MENTION.

##### UNITED KINGDOM.

15 CALLEY, S.—For paints of Torbay oxide of iron, and ochres.

16 COONEY, C. & Co. 57 and 60 *Back lane, Dublin*.—For starch, blues, &c.

18 GOULDING, W. & H. M. 108 *Patrick st. Cork*, and 22 *Westmoreland st. Dublin*.—For artificial manures, and the materials used in making them.

23 KANE, W. J. & SON, 54 *North-wall quay, Dublin*.—For sulphate of soda, sulphuric and other acids.

25 MACKAY, J. W. 40 *Westmoreland st. Dublin*.—For manures, and raw materials used in their manufacture.

26 M'MASTER & HODGSON, *Ashtown Oil Mills, Phoenix Park, Dublin*.—For rape and linseed oil and cakes.

33 SIMON, L. *Nottingham*.—For bronze powders.

40 BEWLEY, HAMILTON, & Co. *Sackville st. Dublin*.—For collection of pharmaceutical chemicals.

42A BOILEAU & BOYD, *Bride st. Dublin*.—For pharmaceutical chemicals.

833 SHAGRAVE, G. & Co. *Hargreave's Buildings, Chapel st. Liverpool*, and *Seacombe, near Birkenhead*.—For excellence of manufacture of phospho-guano, and high value of same.

836 RUMSEY, W. S. 3, *Clapham-row, London*.—For good quality of plate powder and polishing paste.

#### VICTORIA.

24 LYONS, J. C. *Ballaarat*.—For lignite and manures.

40 MACDONALD, C. *Parepa*.—For samples of curing salt, from Lake Bolac.

#### BELGIUM.

17 DEFREZ-HENIN, *Chatelet, near Charleroi*.—For wheat starch.

18 HOORICKX & GORRISEN, *Brussels*.—For iron minium and ochres.

23 SMAELEN, P. *Brussels*.—For copal varnish.

#### ITALY.

29 COMPAGNA, BARON LUIGI, *Corigliano (Calabria Citeriore)*.—For liquors.

31 COSSINI, LUIGI (Heirs of), *Florence*.—For collection of pigments.

33 GAROFOLETTI, FERDINANDO, 28 *via Sta Maria, Milan*.—For ink, and a crystallizable fluid used in its preparation.

37 MIRALTA, BROS. *Savona (Genoa)*.—For glue.

40 PIERINI, BALDASSARE, *Florence*.—For inodorous matches, made without sulphur or phosphorus.

#### ROME.

8 THE SAVORELLI PATRIMONY.—For stearine candles.

#### ZOLLVEREIN.

17 FUNCKE, EMIL. *Andernach, R.P.* For soap and perfumery.

20 REMME & FRIEDMANN, 28 *Alexander st. Berlin*.—For chronometer oil.

22 FARINA, J. M. WIDOW, *opposite the Altmarkt, Cologne, R.P.*—For Eau de Cologne.

23 MARTIN, M. C., *Klosterfrau, Cologne, R.P.*—For Eau de Cologne.

24 FARINA, J. M. *opposite the Josephsplatz, Cologne, R.P.*—For Eau de Cologne.

### SECTION III.—SUBSTANCES USED AS FOOD.

43 EGAN, COTTER, & Co. *Cecilia st., Dublin*.—British wines, liqueurs, spirits.

44 BAGOTS, HUTTON, & Co. 28 *William st. Dublin*.—Irish whiskey.

45 BAKER, SIMPSON, & Co. 40 *Patrick st. Cork*, and 98 *Capel st. Dublin*.—Biscuits in 60 varieties.

46 BROWN & POLSON, *Royal Starch Works, Paisley*, and 98 *Capel st. Dublin*.—Patent corn flour; sago; powder starch; crystal corn starch; maize gluten, for feeding cattle.

47 COX, J. & G. *Georgie Mill, Murrayfield, Edinburgh*.—Gelatin and glue.

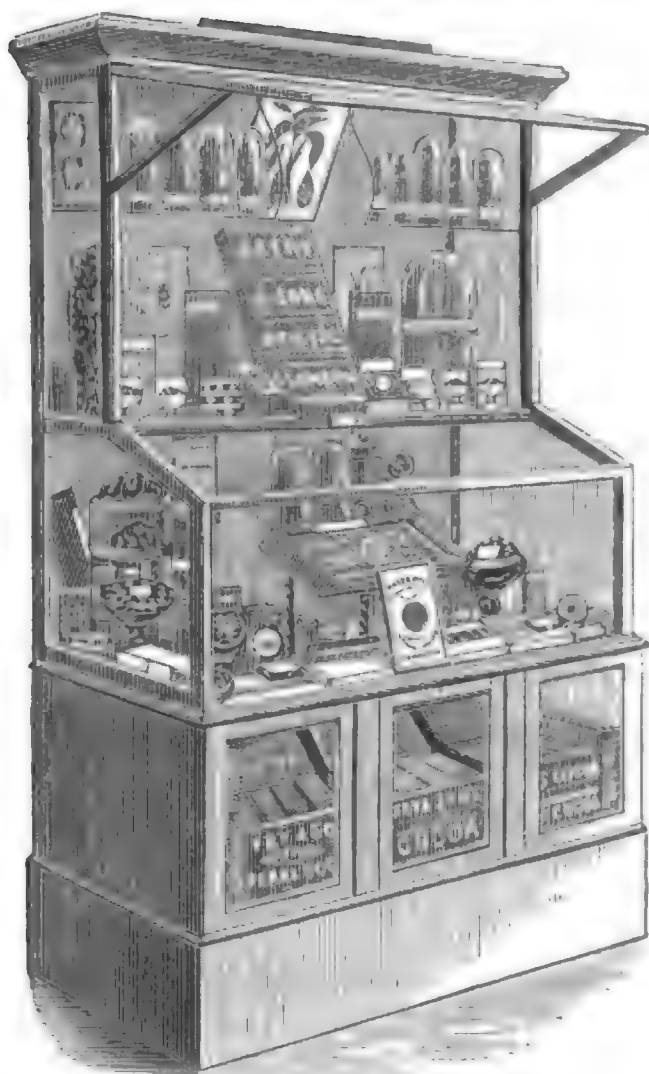
48 EVANS & STAFFORD, *Campbell st. Leicester*.—Cigars.

49 JOSEPH STORRS FRY & SONS, 12 *Union st. Bristol*, and 252 *City Road, London, E.C.*—Chocolate and Cocoa Manufacturers by Appointment to the Queen and Prince

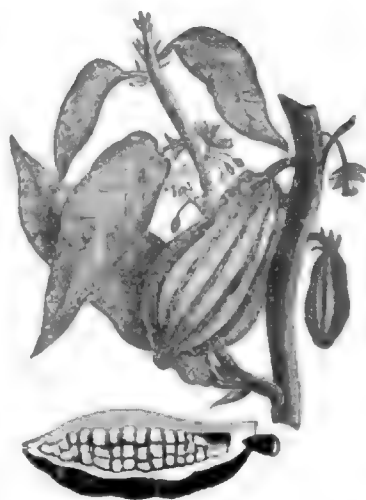
of Wales. Series illustrating the preparation of chocolate and cocoa from the native plants.



Prize Medals, London, 1851 and 1862; New York, 1853; Paris, 1855; and Dublin, 1865.



Show Case, Dublin Exhibition, 1865.

Leaf, Flower, and Fruit of the *Theobroma Cacao*, with Pod opened.

SERIES ILLUSTRATING THE  
MANUFACTURE OF CHOCOLATE  
AND COCOA.

1. Botanical Specimens — Leaves, Flowers, Wood, Fruit, &c.
2. Raw Cocoa, as imported — Specimens of Caraccas, Trinidad, Grenada, Guayaquil, and other descriptions.
3. Illustrations of stages of manufacture, including Roasted Cocoa, Cocoa Nibs, Cocoa Shells, Chocolate, Vanilla, &c.
4. Manufactured Articles, as sold by J. S. FRY & SONS,

FRY'S CHOCOLATE FOR THE TABLE  
FRY'S CHOCOLATE FOR EATING  
FRY'S CHOCOLATE CREAMS  
FRY'S HOMOEOPATHIC COCOA  
FRY'S PEARL COCOA

and many other varieties.

**THE DUBLIN EXHIBITION PRIZE MEDAL** has been awarded for "EXCELLENT QUALITY OF CHOCOLATE;" the Jury remarking, "The Chocolate of Messrs. Fry & Sons is a very pure substance."

**J. S. FRY & SONS' CHOCOLATE** has been used by the Royal Family for more than 100 years, and they have been honoured with the appointment of Manufacturers to the Queen and Prince of Wales. In further proof of the position assigned to J. S. FRY & SONS' Chocolate and Cocoa, it is only needful to refer to the fact that Prize Medals were awarded to the firm at the Five Great Exhibitions of the Industry of all Nations, viz.:—London, 1851; New York, 1853; Paris, 1855; London, 1862; and Dublin, 1865.

**50 GAMBLE, J. H. & Co.** 6 Morrison's Quay, Cork, and 78 Fenchurch st. London, E.C.—Preserved meats, fruits, soups, fish, &c.; pickles, jams, &c.

**51 GLORNEY, B. & Co.** Mardyke Mills, Chapelizod, Dublin.—Mustards, mustard oil and cake; blues; ginger and starch.

**52 ROGERS, E.** 3 Winchester Buildings, London, E.C.—Turkish tobacco and cigarettes.

**53 HART, J. W.** 60 St. Mary Axe, London, E.C.—Isinglass from various countries, in the raw and manufactured states.

**54 MACROBT, R.** Ardmore Mill, Newtownlimavaddy.—Oats, oatmeal, groats, and shelling; Irish wheat and flour; flax seed; flax straw and scutched fibre.

**55 MITCHELL, S.** 10 Grafton st. Dublin.—Bride cake ornamented.

**56 PECK, FRENCH, & Co.** Dockhead, London, S.E.—Steam-made biscuits.

**57 KINAHAN & SONS,** Carlisle Buildings, Dublin,—Irish whiskey. A grained oak cask with bronzed hoops, and in the centre a well-painted coronet with the well known "L. L." added underneath, was placed within a plate glass case with black frame, picked out with gold edgings. Above were some flask-shaped bottles of the "L. L." whiskey.

**58 POLSON, W. & Co.** Abercorn st. Paisley, Scotland.—Patent corn flour and starch; starch produced from maize, the residue serving as food for cattle.

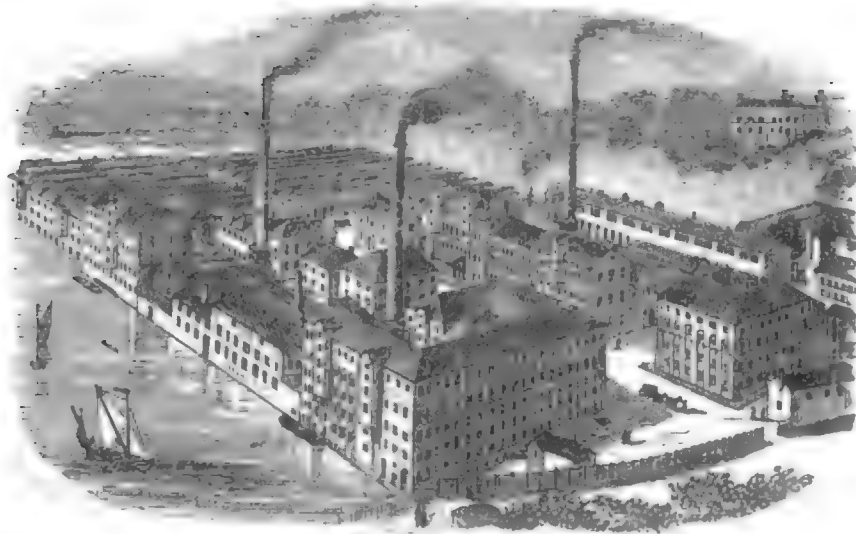
**59 WARRINER, G.** The Cedars, Battersea, London, S. W.—Concentrated soups and preserved meats.

**60 HALLETT, F. F.** The Manor House, Brighton, Sussex.—Pedigree cereals from a single grain.—(Agricultural Hall, Kildare st.)

**61 JACOB, W. & R. & Co.** 5 and 6 Peter's row, Dublin.—Biscuits.

**62 COLMAN, J. & J.** 26 Cannon st. London, E.C.—Mustard, Starch, and Indigo Blue Manufacturers.—Mustard.

As anyone may easily imagine, and as all exhibitors of articles of every day use and consumption have found, it is a task by no means easy of accomplishment to exhibit such articles in an elegant and attractive manner, the great difficulty being to divest them of



Carrow Works, Norwich.

their common-place appearance. Take mustard, starch, or indigo blue, for instance, and it will soon be discovered that unless the case in which they are exhibited is arranged with most peculiar taste and care it will assume more or less the appearance of a grocer's window; and however superior the quality of such articles may be, unless they are presented in such an artistic manner as to enable them to compete for observation with surrounding objects of art and beauty, will be passed by unnoticed.

We may fairly say that Messrs J. and J. Colman have overcome the difficulty above referred to. The press spoke highly in favour of their contributions to the London International Exhibition of 1862; and the two cases they sent to Dublin in 1865 merit equal commendation. They were by far the handsomest on the north gallery, and certainly received their full share of notice and appreciation.

Both cases were designed by Thos. Jeckyll, Esq., Furnival's Inn, London. They were constructed in solid dark walnut, the panels and edges bordered with black ebony in dog's-tooth pattern, with an inner beading of plain gilt. At the back of the mustard case was a large bull's head (Messrs. Colman's trade mark), on a circular tablet of blue, red, and gold. The bull's head was finely carved in ebony, as were also four smaller ones on gilt oval tablets, that surrounded the cornice of one of the iron pillars of the building which passed through the case.

The contents of this case consisted of mustard-seed (brown and white), mustard in process of manufacture, and mustard products in handsomely-carved ebony and laburnum wood bowls. At the back were piled boxes and tins of mustard with the familiar label and trade mark.

Though we so highly appreciate the great beauty and artistic arrangement of this case, we must not overlook what, after all, is of greater importance, namely, the quality of the goods exhibited. But Messrs. J. and J. Colman's mustard needs little commendation from us—the fact that the jurors, not only of the Dublin, but also of the London Exhibition, deemed its superiority to the samples exhibited by other manufacturers so great as to entitle it to the only prize medal, must be in itself a proof of its genuineness, and an ample recommendation to consumers.

One of the readiest tests of the superiority of mustard is colour. Nothing but a very judicious and careful manipulation of the genuine flour of brown mustard-seed will produce the delicate though decided olive green colour observable in Messrs. J. and J. Colman's genuine mustard.

The starch case, though not so large as the one we

have endeavoured to describe, was even more elegant and attractive in its appearance. It contained a pile of rice starch in remarkably large and beautiful prismatic forms, measuring several inches in length. The great, and we may say unequalled, size of these prisms, or crystals, as they are more frequently called, as all chemists know, is a sure proof of the purity of the starch. No common starch manufactured from wheat, sago, or potatoes, could be produced in such a form.

The case also contained samples of indigo blue and coloured starch. The latter attracted no small amount of interest, not only by ladies, whom it more especially concerns, but among chemists and scientific men generally. This coloured starch is a recent invention, and, as *The Times* says, "likely to prove as useful as interesting."

The Society of Arts of London having suggested to starch manufacturers the idea that starch might be made a medium for imparting colour to light fabrics, Messrs. Colman have produced a variety of beautiful brilliantly-coloured starches, which they exhibited this year for the first time. These are intended to convert a white muslin dress, window curtain, or any other light articles into a rich magenta, a delicate mauve, a buff, a yellow or a pink. Nothing but washing in boiling water will remove the colour, but by that process it may be easily and surely got rid of, and the article, restored to its former whiteness, may be again starched and dyed to any colour the owner desires.

Few of our readers would imagine it possible that mustard and starch could be manufactured to such an enormous extent by one firm as we are informed it is by Messrs. J. and J. Colman.

The illustration at the head of the page is engraved from a photograph of their very extensive manufactory.

The following extracts, taken from one of the London newspapers, will give some idea of the operations and process of manufacture there carried on:—

With a competent guide we commence our round of inspection with the warehouses in which the raw materials of the mustard manufacture are stored. Here I find just such an assemblage of sacks as may be seen in any great corn warehouse; but on peeping into these sacks I discover either the brown or white mustard seeds. The brown seeds are very minute, each being but little bigger than the head of an ordinary-sized pin. They are the produce of the Black Mustard, the *Sinapis nigra* of botanists, which is extensively cultivated in the vicinity of Wisbeach. The white seeds, which are familiar to all growers of small salad, come from the species *Sinapis alba*, which is principally raised in Essex and Cambridge. The average price per bushel of the brown seeds is about

15s., and of the white seeds 12s. Mr. Colman informs me that he has occasionally given as much as 34s. a bushel for the former, and 23s. for the latter. The seeds only appear in large quantities in the markets of Wisbech and Mark Lane once a year, and the few manufacturers who use them are consequently compelled to keep heavy stocks. To preserve them for a long period is a task which the farmers have hitherto failed to accomplish, but in these warehouses the temperature and ventilation are so carefully regulated that the seeds will remain unchanged for years.

The preliminary operations of cleansing and drying the seed are performed by means of the ordinary dressing machine and kiln. That so much dirt should be rubbed and blown off those little seeds which look so clean is something really surprising, but beyond this there is nothing remarkable in the dressing process. The kiln is precisely similar to one used for drying corn, being a heated chamber floored with wire gauze; on looking into it, however, I am charmed with the novel appearance presented by the thick layer of tiny seeds which covers the entire floor.

We now enter the main building of the Mustard Works, and my attention is directed, in the first place, to the sieves which are employed to separate the flour of the seed from the husk. These sieves are all formed of silk tissue, and are very costly instruments; some are of extraordinary fineness, indeed one which was shown me calls up the absurd image of a tambourine made with a slice of London fog instead of parchment. The room in which these sieves are used is now exposed to view, and for a few moments I am utterly bewildered with the rapid movements of the workmen and the machines. The men uniformly coloured with the yellow dust remind me of the demons of a pantomime. On one side of the room is a series of vertical rods of wood, each of which has a bulb of iron at its lower extremity. These rods are continually jumping up and down like the beams of an old fashioned stamping mill. They jump to some purpose too, for beneath them is a corresponding series of strong iron vessels or mortars, which are all partially filled with bruised mustard seed. Though these iron shed rods puzzled me a little at first by their peculiar action, they are obviously merely steam-worked pestles. Before being subjected to these bruisers, the seeds are crushed between iron rollers to separate the fixed oil. The pounded material, consisting of both the flour and the bran of the mustard seed, may be seen on every side, in great heaps of a golden yellow colour. To part the chaffy husks from the impalpable powder is the object of the process which now claims my attention.

This process is a very common one, being simply that of sifting; but, as with the pounding, steam-power here supplies the place of muscular force. The sieves are arranged loosely in frames, to which a rapid eccentric motion is given by means of revolving shafts. Each frame will hold eight sieves, and can be looked after by one man. The mustard-flour is shaken through many sieves of different degrees of fineness, and when it leaves this room the remains of the seed coat are only visible to the microscopic eye.

The brown seeds and the white are never operated upon at the same time, as it is important that the two sorts of mustard should be mixed in definite proportions. The flour of the brown seed is far more pungent than that of the white, and is the essential constituent of the condiment. A mixture of the two sorts is, however, generally considered more palatable than the simple brown mustard flour. The mixing of the different kinds is a mere repetition of the sifting process.

I am now shown the Packing Room, where a number of men and boys are performing feats of dexterity far more surprising than the sleights of Robin or Frikell. I see a plain sheet of tin foil suddenly become a shapely case, but the manner in which the lad performs the trick quite escapes my observation. The cases and tins are filled, and then labelled with

equal adroitness. The white, unblistered hands of the packers remind me of a peculiar fact connected with mustard. In the seeds or dry flour chemists do not find the acrid principle for which mustard is so remarkable. The flour must be wetted before we can enjoy it as a condiment, or make use of it for a poultice. The pungent, volatile oil of the black mustard, and the biting acrid liquid of the white, both result from the action of water on some of the constituents of the seeds. The fixed oil, which is expressed from the seeds, is quite devoid of acrimony or pungency, and can scarcely be distinguished from rape oil.

We now proceed to another building to witness the manufacture of a bye-product. I saw in the sifting room an abundance of what may be called mustard bran—the broken skins of the seeds. This I looked upon as mere waste, but now—to my great astonishment—I observe a number of workmen busily engaged in converting it into manure-cake. The process is interesting and somewhat ludicrous. Several long stocking like bags are filled with the bran, and then piled one above another in a hydraulic press. The pump is worked, and the well filled stockings are gradually squeezed flat, while little streams of oil trickle down the press into a reservoir below. The action of the press is now reversed, and the cakes are lifted out one at a time, and handed by the press man to his attendant. The latter, on receiving one of these flattened limbs, rests it on a support and pulls off the stocking. The leg thus exposed to view is about the size, and has nearly the shape, of a tailor's sleeve board. Having likened the cake to a leg, I feel rather uncomfortable when the workman pares the edges with a knife; but I find that the appearance of the mangled limb is greatly improved by the operation. The cake is now ready for the market, and will fetch a good price, as it forms a valuable manure, particularly for land infested with the wire-worm. The oil expressed from the bran is similar to that obtained from the seeds in the preliminary crushing process. My conductor now shows me the spacious warehouse in which the fixed oil is stored, and I here complete my examination of the mustard manufacture.

An immense number of hands are employed at this factory in making the tins in which most of the mustard of the firm is packed. I am shown many labour-saving machines for cutting the metal into the required shape; and, lastly, I am introduced to a large, well-lighted workshop, in which the operations of shaping, fitting, and soldering the tins are performed.

We now commence our inspection of the starch factory. The raw material of this interesting and beautiful manufacture is chiefly rice, the produce of that widely-cultivated grass which botanists name *Oryza sativa*. The small grain grown in Madras and Bengal are usually employed for the sake of economy, but any of the forty or fifty varieties of rice known, would yield nearly the same proportion of starch. Here I am shown the coarse Indian bags containing the raw material which we are about to follow through the establishment, and a number of huge iron cisterns, in which the "liquor," or solution of caustic soda, is prepared. Under these, on another floor, are the vats in which the rice is acted upon by the alkali until the hard grains are rendered so friable that they may be rubbed to a powder between thumb and finger. It is cheaper, however, to use millstones worked by steam than to employ innumerable thumbs and fingers for rubbing down the grains. The steeped rice is ground with water, and from each pair of stones runs a continuous stream of the starch material, which now appears as a thick, creamy liquid.

The creamy product, which contains all the insoluble constituents of the rice in a finely divided condition, is now placed in deep tanks called "separators," and mixed with a large proportion of water. Each tank is provided with a long narrow window of plate-glass, through which the contents can be seen; and inside each there is an agitator, to which a rapid motion may

be given at any time by connecting it with the train of machinery which runs through the factory. The cream of rice is first agitated in these tanks until its particles are well diffused through the water. The agitators are then stopped, and gravitation is allowed to do the work of separation. The particles of skin, fibre, and gluten slowly subside, leaving the minute starch granules suspended mechanically in the water. When the separation is complete, the starchy water is decanted from the sediment, and pumped up through tubes of gutta percha to immense shallow vats in the upper part of the building. These vats, which are called "settling beds," cover a large area, and as they are fixed within a very few feet of the roof, I find my stooping walk around them somewhat fatiguing. My two guides get along pleasantly enough, for they know when to stoop and when to walk upright; besides, happily for them, they do not wear high hats. On reaching the last of the beds, my practical friend bares his arm and fishes up a handful of the deposited starch, which looks like a mass of fresh curd. He tells me that the settling beds are all lined with zinc, that they are refilled with the starchy water every day, and that the deposited starch is cleared out twice a week.

The mixture of fibre and gluten left in the separators is sold at a good price as pig-food. As, however, the pig-keepers in the neighbourhood cannot use up the whole of the product, a set of hydraulic presses are constantly at work squeezing this nutritious material into compact cakes, which can be packed in a comparatively small compass, and transmitted to the hungry pigs of remote parts. I am curious to know the nature of the laborious task which is being performed by a dozen muscular men, and am not a little surprised when I hear that they are merely "blueing the starch." These men stand round a large tank, and mix the thick starch with the colouring matter by means of large wooden shovels. To look at them from a distance, one might imagine that they were operating upon iron instead of starch, for no blacksmiths ever worked harder. The colouring matter is *smalt*, and it is added in small quantities to the starch paste, until the latter acquires the delicate blue tint which most laundresses admire. Some of the starch prepared at this factory is left uncoloured, for in certain parts of England the pure white product is alone used.

The starch-paste, whether blued or not, is passed through sieves to free it from any accidental grit, and then poured into cloth-lined troughs, like mignonette boxes, to drain and consolidate. When sufficiently hard the starch is cut into cubical blocks, each about 5 in. in diameter, and removed from the troughs. Following the blocks we come to a large room, around which are arranged a number of hot closets or stoves. The first and largest of these closets is called the "crusting stove," and into this the cubes of starch are carried and placed in regular rows upon the shelves. After having been exposed for some time in this Turkish bath to a temperature of 140° Fahr., the blocks are removed, and the surface crust is carefully scraped off each. The clean blocks are now packed in paper, tied up, and labelled as though they were just about to be sent from the factory.

This operation surprises me, for an important link seems missing in the manufacture. The parcels are familiar enough, but I never remember meeting with a solid cube of starch in commerce. Starch has always been presented to my observation in curious irregular prisms, and I naturally want to see how these prisms are produced. My practical friend laughs when I communicate my wish to him, and informs me that the starch is "crystallized" after it is packed, merely by exposing the parcels to an elevated temperature for several days. Opening one door after another, he shows me thousands of parcels undergoing the process of stoving; and by breaking open at least a dozen parcels, he thoroughly elucidates the mystery of starch crystallization. Taking a packet which has been sufficiently

stoved, he unpacks it very slowly and gingerly, so as not to destroy the cubical form of the mass of starch within. The mass which he thus exposes to my view is covered with minute cracks, yet it is a perfect cube for all that. I lightly touch it with my finger, and it instantly falls to pieces; where the cube stood I now see a heap of the irregular prisms, or "crystals," as they are commonly, but erroneously termed. These prisms are the parts of a dissected puzzle; but I should as soon think of attempting to count the hairs of my head as of trying to rebuild the cube.

I have now traced the progress of the starch from the bag of rice to the packet of crystals, but much remains to be seen before I can tear myself away from the Carrow Works. The vast warehouse into which I am now conducted enables me to form an adequate conception of the productiveness of the Starch Factory. The packets are arranged in large blocks, between which wide passages are left. In one of the blocks, which has lately been built, I am assured there are 3,082 packets, and this is not by any means the largest in the place. I cannot help comparing the piles of starch to houses; and the whole warehouse will live in my memory as "Starch Town," or the "City of Fecula."

There is an Indigo Blue Manufactory; also a Paper-Mill which claims my attention; but I dare not stop to examine the beautiful machinery which belongs to them, for time flies, and the space at my disposal is too limited. In my hurried walk over the works, I come upon coopers' and engineers' shops, a smithy, steam saw-mills, and many other important adjuncts to the triple Factory for Mustard, Starch, and Blue. I am not astonished, therefore, when my guide informs me, just as I am leaving him, that nearly 1,000 people find constant employment on these great works at Carrow.

63 Hogg & ROBERTSON, 22 Mary st. Dublin.—Cereals.

64 MACRAY, J. 119, George st. Edinburgh.—Quint-essences and other condiments used for flavouring food.

65 ANDREWS & Co. Dame st. Dublin.—Preserved fruits, pickles, &c. The case in which Messrs. Andrews and Company exhibited specimens of their Grocery and Italian goods was octagonal in shape, and consisted of a white oak frame with plate-glass sides, surmounted with oak carvings, and the well known trade mark of the contributors—the red cross of Saint Andrew—besides a number of golden pineapples. Although the contents of the case were of the choicest description, and arranged with very creditable taste, there was nothing of Messrs. Andrews' own manufacture except some well-arranged samples of milk punch, for the preparation of which this firm has been for many years celebrated. Among other novelties, however, were some preserved gooseberries which had been five years in bottle. They were sent to the Melbourne Exhibition of 1861, and returned in good order and perfectly sound. These veteran gooseberries, could they speak, might say much in praise of the careful manner in which they have been preserved.

Messrs. Andrews and Company enjoy a large and an increasing trade, and being anxious to keep pace with the times, have, within the last year or two, had their entire premises remodelled, enlarged, and neatly decorated. The windows on the ground-floor and entrances (of which there are five) have semicircular heads, and moulded archivolt, and key stones moulded in profile to suit the members of the frieze and archivolt which abut against them. A cornice under the first floor windows breaks round the quoins on each front. The windows are filled with polished plate-glass. Those on the second floor have a continuous moulded string at the level of their cills, also broken round the quoins, with architraves and entablatures to each. The two upper storeys have architraves. The whole is surmounted by a massive cornice and blocking in character with the other parts. Added to the outward symmetry and particularly respectable appearance of the building, we notice porters in uniform always in waiting to conduct the customers to and fro.

Internally, the establishment is divided into separate departments, and the systematic arrangement of all the minute details of the business cannot fail to attract the attention of even a casual visitor. The Italian department is stored with the richest collections of home and Continental goods, the variety and excellence of which could not be surpassed even at Fortnum and Mason's. To this department a spacious gallery is added, where a miscellaneous assortment is always at hand, and adjoining this is a room devoted exclusively to Chinese ware from the warehouse of Messrs. Hewitt and Company, of Canton and London. The tea department is extensive, and devoted entirely to the sale of that article. The tea-packing department is situated above the shop, where the tea is separated by one of Savage's honeycomb mills, and packed by machinery in attractive parcels. The provision department is complete and well stocked, though comparatively not so extensive as the leading branches of the business.

The wine and spirit cellars are considered superior in extent to those of any general establishment in Dublin. There are in all twenty-five compartments under the premises extending for a considerable distance under Dame-street. These are all of very ancient construction, but are pretty equal in temperature. On the character of the wines it is unnecessary to enlarge, except to remark that in first-class brands as well as in light wines there is not only an extensive variety, but ample stocks, well stored. The milk punch, already referred to, is an important item in the business, and Messrs. Andrews have also cultivated a large business in Irish whiskeys. They have been awarded medals for this, and also for the "excellent quality of their Irish whiskey," as well as honourable mention for good quality of crystallized fruits, &c. The liqueur room contains more than one would expect to see, considering the limited consumption of these articles; but the taste for Maraschino, Gold-water, and Curaçoa seems to be on the increase in Ireland.

**66 MACKAY, J.** *Westmoreland st. Dublin.*—Seeds, roots, cereals.—(*Agricultural Hall, Kildare st.*)

**67 FAWCETT & Co.** 18, 19, and 20 *Henry st. Dublin.*—Whiskey.

**68 KEEN, ROBINSON, BELLVILLE, & Co.** *Garlick Hill, London, E.C.*—Mustard, indigo blue, chicory, patent barley, groats, prepared corn.

**69 M'KEAN, W.** *St. Mirren's, Paisley, N.B.*—Starch; corn flour.—(*Agricultural Hall, Kildare st.*)

**70 MAZZINI, B.** 14 *Union court, Old Bond, st. London, E.C.*—Turkish tobacco and cigarettes.

**838 KEITH, B. R.** 1 *Ingram court, Fenchurch st. London, E.C.*—"Maizefarina," a breadstuff from maize and wheat; "cerealina" article of diet.—(*Agricultural Hall*).

**839 PATCHETT, E. C.** *Ilkeston road, Nottingham.*—Nottinghamshire sauce.—(*Agricultural Hall, Kildare st.*)

**840 BYRNE, J. J.** 24 *D'Olier st.*—Model of a pig in lard.—(*Agricultural Hall*).

**841 PERRY, BROTHERS, & Co.** *Dublin.*—Biscuits.

#### THE PORTER TRADE OF DUBLIN.

Although malt was not specially exhibited in the galleries, yet as the trade, local and export, is considerable, and the consumption was large in the refreshment rooms, as will be seen by the contractor's returns, some account of it requires to be given in these pages.

The following returns for 1864 shows the number of breweries in Ireland, and the quantity of malt they used.

Collection	Brewers	Victuallers	Quantities of Malt wetted
Athlone, . . .	4	897	1,449
Bandon, . . .	5	1,108	4,314
Belfast, . . .	7	1,162	4,431
Birr, . . .	4	576	1,684
Carlow, . . .	12	1,111	13,536
Coleraine, . . .	4	620	1,202
Cork, . . .	6	1,256	41,647
Drogheda, . . .	5	1,072	18,607
Galway, . . .	7	857	2,458
Limerick, . . .	6	1,567	5,041
Londonderry, . . .	4	1,002	3,179
Newry, . . .	4	1,103	3,116
Sligo, . . .	1	638	1,685
Waterford, . . .	7	899	21,586
Wexford, . . .	5	682	3,439
Country collections	84	14,550	127,374
Dublin, . . .	11	1,028	189,000
Total, . . .	95	15,578	316,974

In comparison with the year 1843, we find that there were in the whole of Ireland, 63 brewers less, 2,652 victuallers more, and an increase of 190,717 quarters in the consumption of malt. In Dublin city there are now four breweries less, and 169 victuallers less than there then were. There are two requisites in the brewing trade, practical knowledge and capital—one cannot succeed without the other. Of the large breweries of the United Kingdom, there are a dozen or more who brew from 200,000 to 500,000 barrels, and upwards, per annum. Those doing the greatest trade are—

Allsop (Burton)	Hanbury (London)
Barclay (London)	Hoare, do.
Beas (Burton)	Mann and Crossman
Charrington	Meux (London)
Combe	Reid
City of London	Taylor
Elliot	Whitbread (London)
Guinness (Dublin)	

The quantity of malt charged with duty in the year 1864 was 6,088,015 quarters, of which, 318,919 quarters were made in Ireland. The annual consumption of hops has been estimated at 10 lbs. per quarter of malt used. The consumption in London is over that amount, and when the great quantity of bitter ale brewed at Burton, Edinburgh, and other places is taken into consideration, 12 lbs. to the quarter is probably nearer the average, or in the aggregate 72,816,180 lbs. The home growth would seem to have been quite inadequate to the demand, judging by the large imports of foreign hops in the past four years:—

	Cwts.	Value
1861 . . . .	149,176	£657,763
1862 . . . .	133,791	723,034
1863 . . . .	147,281	626,660
1864 . . . .	98,656	549,863

#### EXPORTS OF MALT LIQUORS FROM DUBLIN.

Name of Firm	1864	1862	1863	1864	1865
	Hhds.	Hhds.	Hhds.	Hhds.	Hhds.
A. Guinness and Company,	42,966	71,691	78,404	87,846	99,239
R. Manders and Company,	19,058	22,717	24,629	27,043	27,925
Findlater & Co. (estab. 1864)	2,898	17,467	19,348	22,385	26,576
Jno. D'Arcy and Son,	5,008	14,345	1,6084	17,883	20,806
Jamieson, Fim, and Co.	667	6,735	7,724	12,653	19,107
J. Watkins and Company	6,652	11,098	12,346	11,839	14,352
Sweetman, - - -	4,919	6,734	6,746	7,671	8,499
Phoenix Brewery Company,	4,418	4,516	6,465	7,844	7,881
Caffrey and Sons, - -	839	843	813	1,072	1,761
All others, - - -	-	2,041	2,432	2,881	3,187
Total, - - -	86,731	26,077	174,941	198,974	229,674

THE BREWERY OF MESSRS. ARTHUR GUINNESS, SON, AND CO., JAMES'S GATE, DUBLIN.

In the Refreshment Rooms of the Exhibition the admirers of fermented beverages were confined in their choice to Guinness's celebrated porter, and Allsopp's equally celebrated bitter beer. These are, however, amongst the best of their class; and the thirsty visitor, desiring to regale himself with stout or pale ale, could have no misgivings as to getting the best of each in the Exhibition.

Guinness's porter has acquired a cosmopolitan reputation, the export trade in the article being carried on with every part of the globe—a circumstance of the highest interest in this country, with manufacturing industry at a low ebb, and emigrants leaving the country in thousands in quest of employment. Mr. Benjamin Leo Guinness, the only surviving partner of the firm, is also a Representative man in several important respects. He was, moreover, one of the earnest promoters of the Company on whose premises the Exhibition was held. Under such circumstances a brief notice of the James's Gate Brewery can scarcely be regarded as out of place here.

The great porter brewery of Messrs. Arthur Guinness, Son, and Co. may be fairly considered as one of the most important manufacturing undertakings in Ireland. It is certainly inferior to none in beneficial effect on the agricultural interests on which this country mainly depends for the support of its population and the production of its exports.

Barley, which forms the basis of the manufacture of beer, is grown with great success in most of the midland and southern counties of Ireland; and as it is essential for the purpose of malting that it be of superior quality, the large consumption of Messrs. Guinness must have a very material influence on its culture. This will be at once understood when we state that in 1865 200,000 barrels of malt were consumed in this brewery, all of which were grown in Ireland; and allowing a yield of, say 15 barrels per statute acre, this must have been the produce of more than thirteen thousand acres of land.

The comparative size of this brewery contrasts very favourably with that of similar concerns in England and elsewhere. From an official return before us of the year 1840, we find that the above quantity of malt per annum was then only reached by one brewery in England, that of Messrs. Barclay; and we find that at that period the consumption of Messrs. Guinness did not greatly exceed a fourth of its present quantity; while it appears from the malt-duty returns of last year that there are only four brewers in England who now mash more than 200,000 barrels, and that the largest of these does not exceed 300,000 barrels in their yearly brewings. With respect to the breweries of other countries, the largest on the Continent, that of M. Dreker, of Vienna, does not brew more than 100,000 barrels of malt per annum.

From the great increase of their business in the last twenty years, Messrs. Guinness have, of course, found it necessary to remodel the greater part of their concern; and there is no doubt, that in its present thoroughly efficient condition it is capable of meeting a much larger demand.

We shall now proceed to describe the means by which the raw material of barley and hops are transmuted into the finished article of porter. We propose to follow the process from its beginning, endeavouring as we go on to describe the apparatus employed, and to notice especially anything that seems to be novel in its application.

Before barley is fit for the purpose of the brewer, it undergoes the process of malting, or the change of the starch of the grain into sugar. This is done by inducing a germination, or commencement of growth in the grain, by the application of water, and checking the germination or growth at the point where the change of the starch takes place, by exposing the grain to the heat of a kiln. It is not our province, however, to enter into the process of malting, which is one of considerable

nicety and skill, because this department of the manufacture is not carried on at the James's Gate concern, which we are now describing. The malt used by Messrs. Guinness is made by them in malt houses or depôts, situated in districts where the largest quantities of barley are produced; or is purchased in its finished state from malsters, who make its preparation their special business.

The malt then, in its finished state, on its delivery into the brewery is stored in vast bins, or chambers, formed by the walls of a large rectangular building strongly clasped and bound together by iron stays and massive bolts, and separated within into divisions or bins by wooden partitions. Along the top, and underneath these bins, there runs an iron trough, in which a screw of its entire length is constantly turning, and this affords a means of conveying the grain to or from any of these chambers or bins. The malt is raised to the level of the upper screw by means of an "elevator," which is an endless band passing over rollers at top and bottom, and carrying a number of iron buckets, which, dipping into the malt, are filled below and discharge above.

From these stores the malt is removed, by similar machinery, to the separating room, where the dust and other impurities it contains is removed by suitable fans and screens, and where it is divided into large and small grain, afterwards to be separately ground. Here also its quantity, both as to weight and measure, is accurately registered by self-acting machinery. It is then passed between iron rollers, by which it is crushed; after which it is elevated again into a tower, whence pipes, or shoots, as they are termed, lead the crushed malt into hoppers over each of the mash tubs where the next process is performed.

Before we enter upon the mashing we must mention that to impart to the porter its dark colour and peculiar flavour, a portion of dark or roasted malt is added; a certain proportion of it being always ground and sent into the hopper with each portion of malt.

The object now is to dissolve the sugar or saccharine contained in the malt, and for this purpose it descends from the hoppers into the mashtun. A mashtun is a large circular iron vessel, furnished with a perforated false bottom, in which the malt is made into a thoroughly moistened mass or mash, of the consistence of pulp, by mixture with water, hot, but sufficiently below boiling point to avoid turning the starch or gluten of the grain into paste, or what is technically termed "becoming set."

This mash was formerly produced by machinery of rakes and stirrers, revolving in the mashtun itself, the water being added underneath; but it is now accomplished by a very simple and ingenious machine, the invention of Mr. Maitland, a Scotch brewer. The ground malt, descending from the hopper, passes through a copper cylinder, where it is subjected to the action of a number of small jets of hot water, which are so arranged as to convert the malt into a mash of the proper consistence in its descent to the mashtun. This apparatus is quite as satisfactory in its operation as the slower and more laborious process formerly employed.

The saccharine contained in this mash is now washed out by "sparging," or causing a shower of hot water to fall on the top, while at the same time liquid is drawn off at the bottom, through the false bottom referred to above. The solution of malt sugar thus obtained is called "wort," and it is pumped up into coppers where it is boiled for a considerable time with hops, which give the beer its bitter flavour, and impart to it its keeping qualities.

The grains, or residue left after the extraction of the wort, is carried away by means of an endless railway under the mashtun, to a large iron reservoir outside the brewery, where it is divided into shares and removed by contractors for feeding purposes.

The coppers used at James's Gate are larger than in any other brewery. They are six in number, and the

largest stands 30 feet over its foundation, is 22 feet in diameter; it has a furnace of 96 square feet of firebars, and will boil 800 barrels of wort.

Messrs. Guinness are now introducing an arrangement of firebars which seems admirably adapted to these immense furnaces. The firebars are a set of endless chains, passing over rollers before and behind the furnace, which revolve slowly by means of a connexion with the brewery machinery. The effect of this is to carry on the fuel continually from a hopper in front of the furnace to the back, during which progress it is perfectly consumed, without producing any smoke. There is also in this department of the brewery some excellent machinery for returning the hops to the coppers when required to be boiled again, and a beautifully constructed elevator, by which the sacks, or pockets of hops, arriving in the street, are at once raised to the floors where they are stored for use.

From the coppers the wort, after being strained from the hops, is raised by a centrifugal pump to large cooling tanks, from whence it passes to the fermenting squares or tuns. On its way from the coolers to the fermenting tuns, it passes through a set of iron cylinders, containing as much as 50,000 feet of copper tubes of small diameter, arranged perpendicularly, in which it is exposed to the action of a stream of cold water, which rapidly cools it to the temperature required for fermentation.

The fermenting tuns, which are square oaken vessels, are eight in number; they are of very large capacity, some of them holding 1,100 hogsheads, the quantity of the largest brewings now made in this brewery. Here the worts, at the proper temperature for fermentation, are mixed with a certain quantity of yeast from a preceding brewing, and left to stand until the sweet wort is changed into a spirituous liquor, by the natural process of fermentation. This process, which occupies from two to four days, consists in the sugar becoming decomposed with alcohol and carbonic acid gas. The latter is evolved in large quantities from the surface of the wort, causing a peculiar head or froth to rise sometimes to a height of several feet, sending forth a remarkably

pungent and suffocating smell. When this process has been carried on to a sufficient extent, the "gyle," as it is now called, is permitted to run into a set of cleansing vessels, in order to remove the barm or yeast which has been renewed by the fermenting process; and which if permitted to remain in the beer would entirely destroy its keeping qualities, as well as render it foul in appearance and unpalatable to the taste.

The cleansing vessels are a number of shallow cast-iron vessels, open on the surface, and furnished with skimmers to remove the yeast which rises in great quantities to the surface of the gyle on its being transferred to the cleansing vessels. The skimmers travel over the surface by means of racks and pinions, and are capable of being set to skim at any depth.

This part of the brewery, called the storehouse, is quite new, and indeed quite unique in its arrangements. The vessels, of which there are about 25, of a total capacity of about 5,000 hogsheads, are arranged with a view to the most economical use of the space, and for the facility of the operations carried on. They are altogether supported on a framework of rolled wrought iron beams and cast iron pillars; and being brightly painted and well lighted, with ample walking passages and burnished handrails, they form a very neat and interesting object to the visitor.

The iron work in this building has been principally erected by Messrs. P. and W. MacLellan, of Glasgow.

The yeast is collected from the various vessels to a central point, whence it is raised by a chain pump of peculiar construction, to another set of vessels at the top of the building; and from these it descends to be used for exciting fresh fermentations, or to be separated from the beer it contains. Here are at work a number of machines for the latter purpose, the patented invention of Mr. G. A. Waller, principal brewer and engineer to Messrs. Guinness and Co., from whose drawings the arrangements in the building were constructed. This invention is one of so much importance that we present our readers with an illustration, and will endeavour to explain by its aid the advantages it possesses over other contrivances in use.

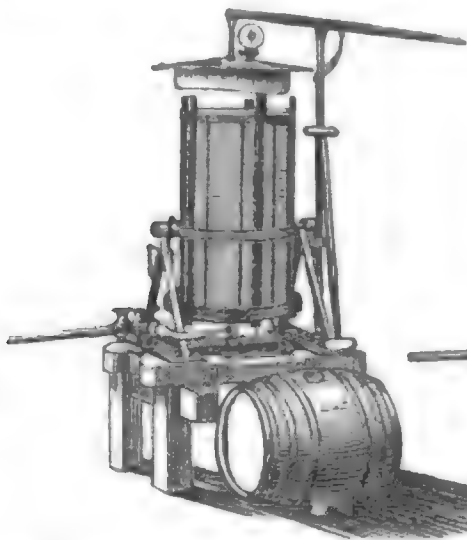


Fig. 1.



Fig. 2.

Six of the largest of these presses are at work in Messrs. Guinness's brewery, and it has also been adopted, though not long introduced, at all the Irish breweries, and in some fifty of those in England and the Continent, as well as in other branches of manufacture. It will be seen by the above engraving that the body of the press consists of a coil of very strong wire, and this is lined with a cotton tube, open at top and bottom, and closed in a very simple and peculiar manner by the internal pressure of the yeast itself when at work. At the base of the vessel is placed a waterproof flexible bag, connected with the ordinary

water cisterns of the establishment by a small half-inch pipe. Into the first mentioned bag or lining of the press is placed a quantity of yeast, as well as what is technically called "bottoms," and, in fact, muddy beer and residue of any kind that it is desirable to render brighter. The cover is fastened down, and water admitted to the expanding bag, which fills and distends by the natural pressure of the water, forcing the yeast upwards, and expelling every drop of liquid, which trickles through the cotton lining of the machine, and then through the crevices of the strong wire frame, the utility of which is to confine the yeast bag within safe limits and



In this part of the concern is also situated the deep well from which the water used for cooling in summer is drawn. No expense has been spared to render it equal to its requirements. It is ten feet in diameter, and over a hundred feet in depth, lined with metal tubing, and furnished with double sets of lifting pumps, and a spiral staircase to the bottom. To increase its power, tunnels or drifts have been run for some distance along the rock at the bottom, which act as feeders for the water supply:

The pumps are driven, in conjunction with the other cooorage machinery, by a very beautiful pair of horizontal engines, made by May of Birmingham, and constructed so as to work together or separately, as required.

We omitted to mention that the brewhouse machinery is worked by three engines, and is provided with five powerful steam boilers, some of which are also employed in heating water; and that most of the newer brewery machinery, which is of very high quality, has been erected by Messrs. Spence, Bros., of Cork-street, Dublin.

The brewery is, however, provided with a convenient millwright's shop, fitted with power-lathes and drilling machines, &c., where the machinery is repaired, and a great deal of new work executed and erected.

The printing department is also well worthy of notice, being provided with the most complete steam machinery for printing, cutting, and numbering the bottle labels, which are afterwards issued to the customers. To guard against the possibility of a label being imitated, Messrs. Guinness adopt the precaution of printing a different number on each bottle label, as is usual on bank-notes; and as no two labels are issued alike, it seems the most effective check against imitation. A very beautiful machine is employed for this purpose, the patent of Mr. Grubb of the Bank of Ireland.

To conclude our survey of James's Gate Brewery, we will state that it stands on about twenty acres of land, and that the number of workmen in the employment exceeds 500. The consumption of coal averages 150 tons per week, and the quantity of water used either for brewing or cleansing purposes is about 400,000 gallons daily.

The rate of wages is higher than is generally paid in Dublin, varying from 12s. to 20s. a week for labourers, and from 30s. to 40s. for tradesmen. There are most liberal arrangements made to provide for the sick in the employment, and the widows are always allowed a pension.

There are from fifty to sixty clerks in the counting-house and out door occupations; and the very best feeling has at all times been evinced between all classes in the concern and the liberal and enterprising employer.

Mr. Guinness is, we believe, at present contemplating the building of workmen's houses on the most improved principles and the most extensive scale—a work which, no doubt, will add very greatly to the comfort and health of the operatives, and be useful as an example in this country.

#### REPORT OF THE JURY.—SECTION III.

Although, from an æsthetical point of view, the "Substances used as Food" do not form a very attractive feature of the Exhibition, they, nevertheless, constitute one of the most important—in one sense the most important—collection of articles shown therein. If the great object of the Exhibition be to render facile, pleasurable, and popular a knowledge of the resources of foreign and colonial countries—to exhibit the condition of their agriculture, art, and manufactures in comparison with that of our own industries—then the "food substances" shown in the Exhibition acquire a high degree of interest, because they afford one of the best means by which such a comparison may be made. It is true that the civilization and material prosperity of a country cannot be solely measured by the quantity and quality of the food produced in it—that is but one of several indices; but it is certain that a knowledge of

the acreable produce of a country, and of the variety and comparative excellence of its manufactured goods and beverages, enables one to form a tolerably accurate estimate of the social condition of its inhabitants.

In this large and varied collection the produce of every variety of climate and soil is exemplified; and even those denizens of the air and inhabitants of the deep that minister to man's wants are here represented. In most of the Colonial departments reports and pamphlets give valuable statistics and other information relative to the food substances sent from those countries. From these documents and the articles exhibited, the visitor may correctly inform himself on the subject of the products of each of our respective colonial dependencies.

Many of the food substances are rather curious. In the Chinese department may be seen specimens of the esculent nests of swallows, an article greatly prized by the inhabitants of the "Flowery Land." The articles from Siam embrace the "edible flying bat," which is regarded as a most delectable food by the natives of that empire. Preserved *fresh* fish is shown in the Nova Scotian department. Australia sends salted mess beef, of such good quality that it might easily be palmed off as of home preparation. The Kingdom of Italy exhibits goats'-milk cheese, hams "fit to be eaten raw or cooked," and vinegar 104 years old. Finally, the Indian collection includes no fewer than eighty different specimens of tea.

The number of exhibitors in this section is no less than 381, exclusive of Mr. P. L. Simmonds, whose extensive contributions to the Exhibition include a great variety of food substances from China, Siam, Japan, and several of the colonies. The valuable collection of similar products from India is chiefly due to the exertions of Dr. Forbes Watson. The whole collection embraces so many thousand specimens that it would be impossible to particularize more than a few articles or classes of substances which appear to possess more than usual merit or interest.

None of the articles shown in this section possess greater interest than the seeds. The specimens contributed from the colony of Victoria, embrace wheat, oats, barley, Indian corn, flax, tares, beans, peas, and prairie grass. Of these the leguminous seeds are of excellent quality. The oats and barley are, on the whole, only of medium quality, but the wheat is particularly good. Of a fine colour, with smooth skin, and on the average weighing sixty-eight pounds per bushel, this Australian wheat will some day become a favourite with the British miller and public. The flour prepared from this wheat is of good quality, and is particularly rich in gluten; it consequently would prove a good "muscle-forming" food. The millers of Victoria appear to be very skilful in their business, for the flour is exceedingly fine, and the "sharps" have been deprived of every trace of farina. The foods and beverages contributed by this colony include arrow root, groats, bread, biscuits, maizena, maccaroni, semolina, vermicelli, pickles, sauces, butter, cheese, bacon, beef, confectionary, porter, ale, whiskey, wine, white spirit, rum, treacle, and sugar. One of the most interesting articles in the Victoria collection is the "mess-beef." It has been simply well salted, and carefully packed in casks. After two days steep it retains but a small proportion of salt; and possesses an excellent flavour, as well as being tender. This meat is a far more palatable food than the jerked beef which hitherto has been imported from South America; and if it were imported in sufficient quantity, and offered at a moderate price—say 4d. per pound—it would be certain to command a large sale. The colony of Victoria is one of the most distant dependencies of the British crown, and when beef can be conveyed without deterioration from a region so remote to this country, it seems strange that colonies nearer home should not supply the mother country with this prized commodity. Canada, Nova Scotia, and New Brunswick, have extensive pastures on which vast quantities of animal food could be cheaply produced. As the sea passage between these

countries and our own occupies less than a fortnight, beef and mutton could be imported from them in winter in a fresh state, or but slightly pickled. At present the demand for animal food is very great; and as the supplies of it are likely to be seriously diminished by the ravages of the cattle plague, a useful hint might be taken from the fact that good corned beef can be obtained from Australia. In the matter of wines there is a manifest improvement since 1862, both in character, variety, and manufacture. The malt liquors and whiskey also are on a par with the British.

The other colonies are not nearly so well represented in this section as Victoria. From Nova Scotia the contributions are chiefly excellent collections of cereals and garden seeds, and some splendid samples of maple sugar. The preserved fish shown in this department was adjudged a medal, as were also some cordials, of novel taste, being flavoured with the essence of native wild fruits. The agriculture of Canada is fairly represented by three illustrative collections, contributed by official bodies. A sample of tobacco, shown by Mr. McCollum, is of extremely good quality, and is interesting inasmuch as this plant has only recently been cultivated in Canada. From the Mauritius there are numerous samples of refined sugar, all of the best quality.

Amongst foreign countries Italy occupies the most prominent position as a contributor of food substances. Hams, Bologna sausages, and other kinds of preserved meat are largely exhibited in this department. Of these a large proportion has unfortunately been spoiled by the action of the sun to which these articles were much exposed, but the portion which escaped is of very good quality, though, perhaps, not in some respects suited for the British palate. The ham "fit to be eaten, raw or cooked," is highly flavoured, and has a garlic odour; and, though much liked in Italy, would not be generally appreciated here. The macaroni paste for soup, and other farinaceous articles shown here are superior to anything of the kind made out of Italy. One of the best articles in this department is the Parmesan cheese, the flavour of which is particularly fine. The liqueurs are, in general, very pleasant in flavour and well made. There is also a large collection of wines of a more varied character perhaps than any similar collection in the building; but, owing, to some extent, to imperfection of manufacture, but more particularly to the action of the sun to which they have been mercilessly exposed, they have suffered so much as to render a fair opinion of their merits impossible.

France contributes excellent coffee, chocolate, and preserved fruits. The chocolate of Menier is particularly good; and the same may be said of Gy's coffee. Gy was the first who "torrified" coffee by means of heated air instead of the application of heated iron; a plan by which the aromatic qualities of the seed were much improved. The wine in this department is, as might be expected, of excellent quality, so far as it is represented. It is, however, much to be regretted that the collection is so small and imperfect. Indeed, with the exception of some most excellent Burgundy, and one or two exhibitors of Champagne, there is nothing to mark the high position of France in these productions, and no data wherefrom to make a comparative estimate of its progress. The brandies, however, are better represented, and are of the first quality.

In the Netherlands Department there are excellent specimens of wheat and rye flour, ship bread, and biscuits. Amsterdam, famous for its sugar refineries, is represented by splendid samples of crystallized white sugar. The hops and seeds contributed by Belgium are of good quality. The high position of the Netherlands as a producer of exquisite liqueurs and Schiedam is fully maintained.

In the Zollverein department some samples of flour from the Stettin Steam Mills Company are deserving of notice. The best flour imported into Ireland is that kind of French termed Gruaux. A comparison of a

sample of the Stettin flour with the Gruaux showed that the former was a shade better in colour, whilst being equally good in "strength." When baked the Stettin flour produces extremely white bread. It is to be hoped that this flour will be imported before long into these countries, where the taste for very white bread so generally prevails. A specimen of hops grown in Pomerania was awarded a medal. It appears that this plant is largely cultivated in Pomerania and Prussian Poland, and that the growers are anxious to do an export trade. Hops are, occasionally, a scarce crop in England; and their consequently high price seriously diminished the profits of the brewer. Should Posen and Pomeranian hops ever find their way into the British market they would, by competition, check the tendency to high prices to which the British grown article is liable.

The Zollverein wines are very inadequately represented; some of the Rhine and Moselle wines are, however, excellent. The wines from Austria and Hungary are deserving of especial notice. There is a very fair collection both of red and white wines, still and sparkling, of kinds but little and imperfectly known in this kingdom. Their excellence in quality and manufacture, added to their cheapness of production, bid fair to make them dangerous rivals to French light wines. They are most agreeable, fragrant, and pure, with the further recommendations of novelty and cheapness.

The food substances of the British Isles are rather inadequately represented by thirty contributors. Messrs. J. H. Gamble, of Cork, exhibit several cases of preserved fish, meat, and soup. The preparations of this firm have long been held in great repute by travellers; and a careful examination of those in the Exhibition fully proved that the meat and fish had really been preserved, and were very well flavoured. The biscuits shown by Messrs. Jacob & Co., Messrs. Baker, Simpson, & Co., and Messrs. Peak, Frean, & Co. present a striking contrast to the biscuits made twenty years ago; they are beautifully white, and very fine in texture. The gelatine shown by Messrs. Cox, of Edinburgh, is one of the finest samples ever exhibited. The chocolate of Messrs. Fry & Sons is a very pure substance; and the collection of articles illustrating the manufacture of chocolate is deserving of notice. The groats and barley shown by Messrs. Keen, Robinson, & Belleville are particularly good. Messrs. J. & J. Colman's mustard possesses a very fine colour, aroma, and flavour, and is evidently the product of a most carefully conducted manufacture. The British wines of Messrs. Egan and Cottle, and of Bewley & Draper, of this city, are deserving of the highest commendation, as are also the liqueurs of the former firm.

CHARLES A. CAMERON, M.D., Reporter.

#### LIST OF AWARDS. MEDAL.

##### UNITED KINGDOM.

43 EGAN, COTTLE & Co. *Cecilia st. Dublin*.—For excellence in ginger and lemon wine, and for imitation of foreign liqueurs.

45 BAKER, SIMPSON, & Co. 40 *Patrick st. Cork*, and 98 *Capel st. Dublin*.—For excellent quality of biscuits.

47 COX, J. & G. *Gorgie Mills, Murrayfield, Edinburgh*.—For excellent quality and purity of gelatine and glue.

49 FRY, J. S. & SONS, 12 *Union st. Bristol*, and 252 *City road, London, E.C.*—For excellent quality of chocolate.

50 GAMBLE, J. H. & Co. 6 *Morrison's Quay, Cork*, and 78 *Fenchurch st. London, E.C.*—For excellent quality of preserved meats, soups, and fish.

56 PECK, FREAN, & Co. *Dockhead, London, S.E.*—For excellent quality of steam-made biscuits.

57 KINAHAN & SONS, *Carlisle Buildings, Dublin*.—For excellent quality of Irish whiskey.

61 JACOB, W. & R. & Co. 5 and 6 *Peter's row*, Dublin.—For excellent quality of biscuits.

65 ANDREWS & Co. *Dame st. Dublin*.—For excellent quality of Irish whiskey and milk punch, and HONOURABLE MENTION for good quality of preserved fruits, pickles, &c.

68 KERN, ROBINSON, BELLVILLE, & Co. *Garlick Hill, London, E.C.*—For excellent quality of groats and barley, and HONOURABLE MENTION for good quality of mustard.

838 KRITH, B. R. 1 *Ingram court, Fenchurch st. London, E.C.*—For excellent quality of "maizefarina."

839 PATCHETT, E. C. *Ilkeston road, Nottingham*.—For excellent quality of Nottingham sauce.

841 PERRY, BROS. & Co. *Store st. Dublin*.—For excellent quality of biscuits.

#### CANADA.

7 COMMITTEE OF THE EASTERN TOWNSHIPS OF LOWER CANADA.—For illustrative collection of produce in Section III. Also for collection of school books and maps in Section XVII.

8 BOARD OF AGRICULTURE OF UPPER CANADA.—For illustrative collection of produce.

9 BOARD OF AGRICULTURE OF LOWER CANADA.—For illustrative collection of produce.

10 M'COLLUM, J. *Howard*.—For excellent quality of tobacco and maple sugar.

#### MAURITIUS.

1 WIERE, C. & Co.—*Labourdonnais Estate*.—For excellent quality of sugars.

7 THE COMMITTEE.—For illustrative collection of produce.

10 POUPINKI, DE VELANCE, L. F.—For excellent quality of "Ravensara" liqueurs.

17 LORRY, E. *La Gaicth Estate*.—For excellent quality of sugar.

22 PITOT, HON. H. *St. Aubin Estate*.—For excellent quality of sugar.

26 BENOICOURT, M.—For excellent quality of cigars.

#### NATAL.

19 REYNOLDS, T.—For excellent quality of rum.

#### NEWFOUNDLAND.

1 DE GROUCHY, REMOUP, CLEMENT, & Co. *St. Helier, Jersey*.—For excellent quality of preserved fish.

#### NEW SOUTH WALES.

1 COOPER, Sir D. Bart. 20 *Prince's garden, London*.—For general excellence of Australian wines.

#### NOVA SCOTIA.

3 BARBER, J.—For excellent quality of preserved fish.

20 CROSKILL, J.—For excellent quality of wild cherry cordial and brandy, and HONOURABLE MENTION for other cordials.

34 HILL, Sheriff.—For excellent quality of maple sugar.

50 M'NAB, J.—For excellent quality of cereals.

51 MOIR, T.—For excellent quality of biscuits.

52 MOYLE, H. M.—For excellent quality of cereals.

67 WATT, J.—For excellent quality of tobacco.

N.B.—The exhibitor of apples is awarded a medal through the superintendent of the colony, DR. HONEYMAN, the exhibitor's name being unknown.

#### VICTORIA.

48 CLARK, A. & Co. *Melbourne*.—For excellent quality of spring wheat, oats, and barley.

49 COFFEY, J. *Spring Hill, Cresswick*.—For excellent quality of wheat.

61 OVENS & MURRAY AGRICULTURAL SOCIETY.—For excellent quality of wheat, oats, and flour.

73 BIGNELL, H. *Melbourne*.—For excellent quality of meat, beatsfoot and trotter oil.

75 WATSON & PATERSON, *Northcote*.—For excellent quality of beef and bacon.

77 VICTORIA SUGAR Co. *Sandridge*.—For excellent quality of sugar, and HONOURABLE MENTION for white spirit and rum.

80 DUNN, R. & Co. *Warrenheip Distillery*.—For excellent quality of whiskey and gin.

81 MARTIN, P. J. *Melbourne*.—For excellent quality of stout.

83 WILD, E. *Collingwood*.—For excellent quality of ale, and HONOURABLE MENTION for good quality of stout.

86 EVERIST, J. T. *Hawthorn*.—For excellent quality of "Mataro, Carignan, and Hermitage wines;" and HONOURABLE MENTION for general collection.

94 LOUGHNAN, BROS. *Melbourne*.—For excellent quality of colonial-grown and manufactured tobacco.

95 MOSE, WHITE, & Co. *Melbourne*.—For excellent quality of cigars.

98 OWEN, DUDGEON, & ARNELL, *Melbourne*.—For excellent quality of colonial-grown and manufactured tobacco and snuffs.

97 TOD, T. *Melbourne*.—For his collection of casts of fruits, vegetables, &c.

43 ALLAN & BALDREY, *Wangaratta Steam Flour Mills*.—For excellent quality of flour.

72 URIE, MCNEE, & YOUNG, *Melbourne*.—For excellent quality of Australian maizena.

69 FORDHAM, F. *Emerald hill*.—For excellence of quality of pickles and jam.

#### AUSTRIA.

4 RANOLDER, J. Bishop of Veszprim, *Hungary*.—For excellent quality of Hungarian Wines.

6 BAUER, C. 11 *Taborstrasse, Vienna*.—For excellent quality of "Rostopachin" punch; and HONOURABLE MENTION for general collection.

7 CALLIGARICH, C. *Zara, Dalmatia*.—For excellent quality of "Maraschino."

8 FLANDORFER, J. *Oedenburg, Hungary*.—For excellent quality of white Hungarian wines.

9 KOENTZER, J. *Biola, Galicia*.—For excellent quality of "Chartreuse."

10 LUXARDO, G. *Zara, Dalmatia*.—For excellent quality of "Maraschino."

12 SCHLUMBERGER, R. *Vöslau, near Vienna*.—For excellent quality of sparkling and still Vöslauer.

13 SZEGSZARD WINE TRADING COMPANY, *Szegszard, Hungary*.—For excellent quality of red Hungarian wines.

14 ZICHY-FERRARIS, E. Count, *Nagy Szöllös, Papa, Hungary*.—For excellent quality of pure and cheap wines.

15 ZICHY-FERRARIS, H. Count, *Oedenburg, Hungary*.—For excellent quality of "Tokay."

#### BELGIUM.

25 BLAESS, C. B. *Borgerhout, near Antwerp*.—For excellent quality of vinegar.

29 DE GRYSSE-QUAGHEBUE, *Poperinghe*.—For excellent quality of hops.

30 DE MAX, J. *Antwerp*.—For excellent quality of cigars.

31 DEYMAN-DEUWART, *Charleroi*.—For excellent quality of bitters.

35 LEHON, F. *ainé Brussels*.—For excellent quality of liqueurs.

38 MIRLAND & Co. *Frameries*.—For excellent quality of apple paste.

41 SCHALTIN, PIERRE & Co. *Spa*.—For excellent quality of liqueurs.

42 STEENS, H. *Schooten, Prov. of Antwerp*.—For excellent quality of cereals and kidney beans.

45 VANDEN BERGH & Co. *Antwerp*.—For excellent quality of alcohol, bitters, and gin.

46 VANDE VELDE, N. *ikent*.—For excellent quality of champagne beer and liqueurs.

## FRANCE.

- 10 BELLOT & FOUCAUD, *Cognac (Charente)*.—For excellent quality of French brandy.
- 17 GIBERT, G. *Reims (Marne)*.—For excellent quality of "Sillery," still and sparkling.
- 18 GY, J. F. SON, *Forges-les-Eaux (Seine-Inférieure)*.—For excellent quality of roasted coffee, and for originality in preparation.
- 20 MATRANGUE, BROS. & Co. *Nice*.—For excellent quality of olive oil.
- 21 MENIER, E. J. *Paris*.—For excellent quality of chocolate.
- 22 MEUKOW, A. C. & Co. *Cognac (Charente)*.—For excellent quality of French brandy.
- 26 ROBIN, SON, *Ile d'Espagnac (Charente)*.—For excellent quality of torrefied coffee.
- 27 UNION OF WINE-GROWERS, *Dijon*.—For excellent quality of Burgundy wines.
- 29 GROUT, SON, *Paris*.—For excellent quality of farinaceous products.
- 30 DUFOUR & Co. *Bordeaux*.—For excellent quality of French plums.
- 32 DUCASSE & Co. *Cognac (Charente-Inférieure)*.—For excellent quality of French brandy.
- 33 JOURDAN, BRIVE, SON, & Co. *Marseilles*.—For excellent quality of preserves and oil, and HONOURABLE MENTION for good quality of wines and liqueurs.
- 33A MÉRIG & Co. *Perpignan and Madrid*.—For excellent quality of chocolate.

## ITALY.

- 54 BAZZIGHER, LUCIO & Co. *Sassuolo (Modena)*.—For excellent quality of liqueurs.
- 55 BELLENTANI, GIUSEPPE, *Modena*.—For excellent quality of vinegar, 65 years old.
- 59 BIFFI, PAOLO, 1022 *Corso del Duomo, Milan*.—For excellent quality of "crema d'ananas," and of pastry and chocolate.
- 62 BONAMICI, FERDINANDO, *Vico Pisano (Pisa)*.—For excellent quality of olive oil.
- 64 BOTTAMINI, BARTOLOMEO, *Bormio (Sondrio)*.—For excellent quality of honey.
- 65 BULLI, BROTHERS, *Florence*.—For excellent quality of paste for soup.
- 69 CARBONE, S. *Catania*.—For excellent quality of macaroni, paste, and wheat.
- 76 CIOFFI, LORENZO & SETTIMO, *Pontedera (Pisa)*.—For excellent quality of paste for soup.
- 79 CORA, BROS. GIUSEPPE & LUIGI, *via S. Teresa, Turin, and Costigliole d'Asti (Alessandria)*.—For excellent quality of liqueurs, and HONOURABLE MENTION for good quality of their wines.
- 102 GUKLI, GARTANO *Naracchio (Pisa)*.—For excellent quality of English biscuits.
- 104 ISNARD, PIETRO, *Leghorn*.—For excellent quality of refined Tuscan olive oil.
- 109 LANCIA, BROS. *Piazza del Palazzo di Citta, Turin*.—For excellent quality of preserved meat.
- 114 MARCHI, ANTONIO, *Parma*.—For excellent quality of forage seeds and Parmesan cheese.
- 117 MARINELLI, E. *Parma*.—For excellent quality of paste for soup, and corn and rice flour.
- 119 MARTINI, SOLA & Co. *Chieri (Turin)*; and 34 *via Carlo Alberto, Turin*.—For excellent quality of liqueurs.
- 123 MERENDA, COUNT CESARE, *Modena*.—For excellent quality of "Chartreuse."
- 127 NASI, GUGLIELMO, *Modena*.—For excellent balsamic vinegar, 104 years old; and HONOURABLE MENTION for good quality of ordinary vinegar.
- 133 PAOLETTI, FERDINANDO, *Pontedera (Pisa)*.—For excellent quality of paste, corn and rice flour.
- 170 RACAGNI, BERNARDO, *Brescia*.—For collection of specimens of Indian corn.
- 145 ROYAL ENOLOGICAL COMMISSION, *Turin*.—For collection of wines, especially Florio's Marsala, Morando's Asti, Tarditi's La Morra, and Nerucci's Montale.

- 146 ROYAL TOBACCO MANUFACTORY, *Bologna*.—For excellent quality of cigars and tobacco.
- 147 ROYAL TOBACCO MANUFACTORY, *Lucca*.—For excellent quality of cigars and tobacco.
- 169 RICASOLI, BARON BETTINO, *Florence*.—For excellent quality of "Brolio, Malvasia, and Vermouth."
- 163 BOTTI, ALESSANDRO, *Chiaruri (Genoa)*.—For excellent quality of olive oil.

## NETHERLANDS.

- 6A AFKEN & ZOON, *Parmerend*.—For excellent quality of durable sweetmeats.
- 7 BOGAARD & Co. J. V. O. *Gennep, Limburg*.—For excellent quality of wheat and rye flour.
- 8 BOLS, ERVEN L. *Het Looftje, Amsterdam*.—For excellent quality of curacao.
- 13 DUYVIS, JACOB, *Koog a/d. Zaan*.—For excellent quality of starch.
- 16 FOCKINK, WYNAND, *Amsterdam*.—For excellent quality of curacao and other liqueurs.
- 161 BEUKER & HULSHOFF, *Amsterdam*.—For excellent quality of refined sugar.
- 16L OPPEN, K. VAN, *Harlingen*.—For excellent quality of cigars.
- 18 GROOTES, GEBR. D. & M. *Westzaan*.—For excellent quality of cocoa and chocolate.
- 20 HOPPE, P. *Amsterdam*.—For excellent quality of liqueurs and Schiedam.
- 23 KOFFEN, H. T. *Leerdam*.—For excellent quality of cigars.
- 25 LANS, H. & ZOON, *Haarlem*.—For excellent quality of beer.
- 27 MOUTON, FL. *Hillegersberg, near Rotterdam*.—For excellent quality of ship-bread and rusks.
- 30 REYNVAAN, A. J. *Amsterdam*.—For excellent quality of cigars and tobacco.
- 34 ULRICH, J. S. & C. *Rotterdam*.—For excellent quality of ship-bread, rusks, and biscuits.

## ROME.

- 9 NAZZARI, PIETRO. —For excellent quality of Liqueurs and HONOURABLE MENTION for collection.
- 10 TUCUL, BRNEDETTO. —For excellent quality of olive oil.

## SWITZERLAND.

- 5 CAILLER, F. L. *Vevey, Vaud*.—For excellent quality of chocolate.
- 6 CHERVAZ, LE CHEVALIER, *Vétroz, near Sion, Valais*.—For excellent quality of Malvoisia and other wines.
- 8 TAVERNEY, H. *Vevey*.—For excellent quality of cigars.

## ZOLLVEREIN.

- 25 ROBERTZ, J. *Cologne, R.P.*—For excellent quality of bitters.
- 27 BAUM, P. *Dahlen, near Wickrath*.—For excellent quality of bitters.
- 28 FLATAU, J. P. 18 *Leipziger str. Berlin*.—For excellent quality of Pomeranian hops.
- 33 UNDERBERG-ALBRECHT, H. *Rheinberg, R.P.*—For excellent quality of bitters.
- 34 DEY, A. & Co. *Coblentz, R.P.*—For excellent quality of sparkling wines.
- 35 KEMPE, BROTHERS, *Neustadt, Hardt, Bavaria*.—For excellent quality of sparkling wines.
- 38 HUESGEN, W. & A. *Traben, near Trarbach-on-the-Moselle*.—For excellent quality of wines.
- 39 AUERBACH, H. *Gotha*.—For excellent quality of preserved meat and sausage.
- 40 STETTIN STRAW MILL CO. —For excellent quality of wheat and flour.
- 42 CASSIRER, M. & Co., *Schwientochlowitz, Silesia*.—For excellent quality of bitters, especially Malakoff.
- 108 EHRENBACHER, J. F. & Co. *Leids and Nürnberg*.—For excellent quality of hops and teasles.

## HONOURABLE MENTION.

## UNITED KINGDOM.

- 44 BAGOTS, HUTTON, & Co. 28 William st. Dublin.—For good quality of Irish whiskey.  
 48 EVANS & STAFFORD, Campbell st. Leicester.—For good manufacture of cigars.  
 51 GLORNEY, B. & Co. Mardyke Mills, Chapelizod, Dublin.—For good quality of mustard.  
 53 HART, J. W. 60 St. Mary Axe, London, E.C.—For good quality of isinglass.  
 55 MITCHELL, S. 10 Grafton st. Dublin.—For good quality of cake.  
 64 MACKAY, J. 119 George st. Edinburgh.—For good quality of condiments.  
 67 FAWCETT & Co. 18, 19, and 20 Henry st. Dublin.—For good quality of Irish whiskey.

## MAURITIUS.

- 3 BROUSSE, N. Pamplemousses.—For good quality of vanilla.  
 8 LANGLOIS, MADAME, E. B.—For good quality of nutmegs.  
 11 BOUVET, M. Port Louis.—For good quality of preserved fruits.  
 14 MORCY, MADAME.—For good quality of tamarind.  
 18 LEVIEUX, P. J.—For good quality of vanilla.  
 23 CONSTANTIN & Co. Benares Estate.—For good quality of sugar.  
 30 SAPANT, M.—For good quality of cigars.

## NATAL.

- 17 WILKINSON, A. Sugar Plantation Great Umkunga.—For good quality of rum shrub and rectified spirits.

## NOVA SCOTIA.

- 15 COSTIN, P.—For well-made cider.  
 22 DODSON, —.—For good quality of maize.  
 25 DUPE, G. W.—For good quality of cordials.  
 36 HUTTON, J.—For good quality of garden seeds.  
 48 MACKAY, J.—For good collection of seeds.  
 53 PEYOR, Dr. H.—For good quality of maize.

## VICTORIA.

- 44 ANDERSON, W.—For good quality of wheat.  
 45 BUCHANAN, J. Berwick.—For good quality of wheat.  
 46 CONNOR, J. H. Colac.—For good quality of wheat and barley.  
 51 DEWAR, W. Gisborne.—For good quality of wheat.  
 52 DEWAR, J. Gisborne.—For good quality of wheat.  
 54 GRAHAM, J.—Wahgunyah Plains.—For good quality of wheat.  
 56 HANCOCK, A. P. Warriors, near Colac.—For good quality of wheat.  
 58 M'LAREN, W. Gisborne.—For good quality of rye-grass seed.  
 59 MAUNDER, G. Barnawatha, Ovens District.—For good quality of wheat.  
 60 MATTHEWS, W. Coghill's Creek.—For good quality of wheat and oats.  
 62 OFFICER, J. Tower Hill, County of Villiers.—For good quality of wheat.  
 63 REYNOLDS, J. N. Melbourne.—For good quality of oats and barley.  
 64 SHEEDY, M. Gisborne.—For good quality of wheat.  
 65 THOMPSON, J. Bullingarook.—For good quality of wheat.  
 70 SMITH & SON, Fitzroy.—For good quality of biscuits.  
 74 CROFTS, J. Melbourne.—For good quality of cheese.

- 84 DARDEL, Geelong.—For good collection of wines.

- 89 MAPLESTON, C. Ivanhoe Lodge.—For good quality of white wines.

- 90 PETTAVEL, D.—Victoria and Prince Albert Vineyards.—For good quality of muscat.

- 91 RAU, H. Albury.—For good quality of white wine.

- 92 SCHUDACH, S. Albury.—For good quality of Verdelho and Reising.

- 93 WEBER, BROS. Batesford.—For good quality of white wine marked A.

- 132 COLE, B.—For good quality of white peas.

- 134 KINNESLEY, D. Learmonth.—For good quality of wheat.

- 135 STEWART, BROS. Learmonth.—For good quality of oats.

- 140 ANDERSON, BROS.—For good quality of wheat.

- 141 COX, W. Lancefield.—For good quality of barley.

- 145 LAW, SOMMER, & Co. Melbourne.—For good quality of seeds.

- 146 OLLEBAR, Allansford, Warrambool District.—For good quality of wheat.

- 148 WRIGHT, T.—For good quality of barley.

## BELGIUM.

- 32 DUREE, J. B. D. Brussels.—For good quality of liqueur "Nectar du Brabant."

- 33 IHMDAHL, C. Brussels.—For good quality of liqueur "Elixir des Ardennes."

- 34 LEFEBVRE, W. W. & SON, Braine-le-Comte.—For good quality of liqueur "Parfait Amour."

- 37 MASQUERLIER HORTA, A. Ghent.—For good quality of liqueur "Sirop de Groseilles."

- 40 ROBILLARD, J. B. Hensies.—For his process of arresting decay in hops.

- 43 VAN BUTSELE, G. Nukerke, near Oudenarde.—For good quality of cereals.

- 45 VAN BUTSELE, W. W. Nukerke.—For good quality of beer.

## FRANCE.

- 9 BECKER, J. H. D. Bordeaux.—For good quality of wines.

- 12 BONZEL, E. Haubourdin, (Nord).—For good quality of wheat and flour.

- 13 BOUGUEREAU, G. St. Florent près Saumur.—For good quality of sparkling Champagne wines.

- 14 BRUNET, J. Marseilles.—For good quality of wheat and flour.

- 15 CIZOL, SON, & Co. Bordeaux.—For good quality of preserved fruits.

- 19 LUCK, J. Haguenau (Bas Rhin).—For good quality of liqueur "Crème de Myrtilles."

- 24 PREVOT & Co. Limoges.—For good quality of torrefied coffee.

- 28 VIOLET, J. & Co. Bordeaux.—For good quality of French plums.

- 31 FAU, T. Bordeaux.—For good quality of French plums.

## ITALY.

- 49 ALONZO, GIUSEPPE, Savona (Genoa).—For good quality of paste for soups.

- 50 BALLARINI, GIUSEPPE, Roccabianca (Parma).—For good quality of ham.

- 51 BALLOE, GIUSEPPE, Cambiano (Turin).—For good quality of vermouth.

- 58 BERRUTTI, BROS. Grinzano D'Alba (Coni).—For good quality of wines.

- 60 BOCCARDI, BROS. Cavalela (Capitanata).—For good quality of cheese.

- 70 CARPANO, G. B. 15 Piazza Castello, Turin.—For good quality of cinchona.

- 75 CINZANO, FRANCESCO, via Doragrossa, Turin.—For good quality of dry punch, and collection in general.

83 D'ALBERO, ANTONIO, 218 and 219 strada Toledo, Naples.—For good quality of candied fruit and vegetable marrow.

84 DANIELLI, DR. DOMENICO, Buti (Pisa).—For good quality of olive oil.

93 FRANCIOSI, PIETRO, Terriccola, near Peccioli (Pisa).—For good quality of olive oil.

95 GALLUCCI, MICHELANGELO, Palmi (Calabria Ultra prima).—For good quality of ordinary vinegar.

97 GANCIA, BRO. Chivasso (Turin).—For good quality of vermouth.

100 GRAZZINI, PELLEGRINO, Colleoli (Pisa).—For good quality of olive oil.

105 JACONO, ANTONINO, Messina.—For good quality of cigars and tobacco.

110 MAJORANA, BRO. Catania.—For collection.

139 PRATI, GIUSEPPE, Alessandria.—For good quality of elixir.

142 RICABOLI, BARON VINCENZO, Florence.—For good quality of dry wine and olive oil.

151 SOISEI, MICHELE, Bari.—For good quality of almonds.

156 TORO, B. and SONA, Tocco (Abruzzo Citeriore).—For good quality of centerba.

#### NETHERLANDS.

9 BOORTZ, H. Amsterdam.—For good quality of "Persico" liqueur.

16A GENDRINGEN, G. VAN, Kampen.—For good quality of manufactured tobacco.

19 HOOCHWINKEL, J. Gorinchem.—For good quality of buck wheat.

21 HUNCK, H. P. Amsterdam.—For good quality of chocolate powder.

24 KORFF & Co. F. Amsterdam.—For good quality of chocolate.

29 PETERS, P. L. Leyden.—For good quality of buck-wheat.

35 VERWEY, JEN. A. J. Deventer.—For good quality of cigars.

#### SWITZERLAND.

4 BOUVIER, Neuchâtel.—For good quality of sparkling wine.

7 ORMOND & Co., Vevey and Geneva.—For good quality of cigars.

9 WARNERY, H. Payerne.—For good quality of cigars.

#### ZOLLVEREIN.

26 FALK, A. Berlin.—For good quality of sherry punch.

29 PIEPER, W. L. & Co. Elberfeld, R. P.—For good quality of liqueurs and bitters.

30 HEIDEN, R. Cöthen, Anhalt.—For good quality of chocolate.

31 ENGELHARDT, F. Russelheim near Mayence, Hesse.—For good quality of chicory powder.

36 GREVE-STIENBERG, Ph. Bonn, R.P.—For good quality of bitters.

### SECTION IV.—VEGETABLE AND ANIMAL SUBSTANCES CHIEFLY USED IN MANUFACTURES, AS IMPLEMENTS, OR FOR ORNAMENT.

71 HAWES, J. 7 Adelphi terrace, London, W.C.—Anatomized leaves and seed-vessels.

#### REPORT OF THE JURY.

THE labours of the Jury in Section IV. have been lighter than usual at International Exhibitions, in consequence of but a small quantity of the animal and vegetable substances used in manufactures being shown by different countries. This is attributable in some degree to the early expressed desire of the Executive Committee to make the Exhibition as generally attractive as possible to the public by fine arts and manufactures. The building being small, they preferred to receive finished products of industry to the raw material.

Hence we find that on the British side there is an entire absence of any article coming under this class, with the single exception of some anatomised leaves and seed vessels shown by J. Hawes, London (*United Kingdom* 71), which, from the ingenuity and taste displayed in the preparation and arrangement, they have thought worthy of a medal.\*

Passing now to the British Possessions, the first that claims notice is India, where the Jury found so admirable a collection arranged of the substances used in manufactures, comprising oils and oil seeds, Nos. 287 to 326; gums and resins, 327 to 366; dyestuffs and tanning materials, 376 to 406; animal products, as lac in its various forms, and beeswax, 487 to 510; cocoons and raw silks, 511 to 529; wool, 530 to 551; vegetable fibres, 552 to 590; cottons, 591 to 673—that they unanimously awarded a medal to the India Board as the producers of this fine and instructive collection. A few descriptive particulars as to those substances may not

be out of place, India being the main source of our supply for most of them. The rape and mustard seeds, the produce of various species of *Sinapis*; linseed, poppy, and sesamum seeds; the seeds of the castor oil plant, and other oil yielding seeds, are largely imported from the East for the purposes of the oil crusher; and there are also several of the more solid oils, especially very fine cocoa-nut oil, which are shipped to an immense amount from Cochin and Ceylon. The gums and resins are also of great importance in Indian trade, whether they be the odoriferous benzoin, myrrh, and olibanum; the anime, piney resin, and dammar, for the use of the varnish maker; the dragon's blood and gamboge, for colouring purposes; asafetida, ammoniacum, and kino for medicinal purposes; the soluble gums, as babool, or Arabic, and the other mixed gums of commerce; and the elastic gums, caoutchouc, gutta percha, cattimandoo, and mular gum, &c. In the division of dyestuffs and tanning materials there are several Indian ones in which a very large trade is carried on, especially the various descriptions of indigo, madder, munjeet (another species of *Rubia*), and chay root (*Oldenlandia umbellata*), turmeric, safflower, and sapan wood. There are several useful tanning barks, myrabolans the dried fruit of some species of *Terminalia*; galls of different kinds; catechu, obtained from the *Acacia Catechu* and the *Acacia Catechu*; and Gambir, better known in common as terra japonica, obtained in Singapore from the *Nauclea gambir*. Among the animal products lac is interesting to the visitor in its various forms of stick lac, as produced on the small boughs of different trees by the insect, grain lac, shell lac, and lac dye in square cakes. The cocoons and silks of the Tusseh, Eria, Moonga, and Mezankoree wild moths are curious in comparison with the cultivated varieties shown in Italy. The sheep's wool of India does not bear a high character, but the shawl wool of the Cabul goat, the hair of the yak (a species of ox), and

\* The collection of Messrs. Ganly, Son, & Parker, Dublin (*United Kingdom*, 380), of Irish grown wools is exhibited in the same section as the woollen goods.

the hair of the camel, are important materials in textile manufactures. There is no more productive source of vegetable fibres than India. Besides flax, to which some attention is now given, three samples are shown of the China-grass or Rhea fibre, both in the rough, and softened, prepared and bleached. There can be little doubt that ere long this beautiful strong silky fibre, with that of the Puya and Nilgherry nettle, and other species of *Behmeria* and *Urtica*, will be largely used by manufacturers. Jute fibre now keeps the Dundee manufacturers extensively and profitably employed; and as Dr. Forbes Watson and Dr. Royle have shown in their works, there are hundreds of valuable Indian fibres yet waiting to be profitably introduced into commerce. Although Indian cottons generally, cannot compete in length of staple with American grown, yet but for the extensive supply obtained in the last few years from India, the Manchester mills would have had to be entirely closed. There is no limit to the supply of cotton that might be furnished by India if fair remunerative prices could be obtained.

The British Colonies are necessarily large exhibitors of raw products, these forming the mainstay of their wealth, and but few of the colonies have as yet established local manufactures of any importance. No less than twenty-one of the Colonies exhibit; and, considering the limited space allotted them, there is a very creditable collection shown. Taking the colonies in the alphabetical order in which they stand, the Jury desire to make honourable mention of an interesting collection of woods, sticks, cotton, bark, fibres, &c., sent by his Excellency Governor Rawson, from the Bahamas. Canada sends a fine collection of woods, flax, &c., and the Jury have awarded a medal to the Abbé Brunet for a varied and prepared series of woods; and would make honourable mention of the flax in the straw shown by Mr. Morris, and of the hemlock bark and prepared extract therefrom, for tanning, shown by J. Miller. A medal has been awarded to the Jamaica Cotton Company (*Jamaica*, 1), for fine samples of cotton grown upon their estates, and for a collection of fibres; also a medal to Mr. N. Wilson, of Jamaica (*Jamaica*, 6), for a large and beautifully prepared collection of fibres, cleaned and dyed, &c. Honourable mention is also made of a good collection of Jamaica sticks, in the rough and finished state, for umbrellas and walking sticks, shown by E. B. Roberts, of London (*Jamaica*, 2); and to G. Roberts (*Jamaica*, 3), for some large polished specimens of Jamaica furniture woods. A fine collection of raw products from our colony of Lagos, consisting of woods, oils, and oil seeds, fibres, and cottons, mats, matting, &c., with the fibres and grasses of which they are made, sent by Mr. Edward Simmonds, has been honourably mentioned. In the Mauritius collection honourable mention is made by the Jurors of a series of fibres prepared by Mr. J. Duncan, and shown by Professor Bouton (*Mauritius*, 16). The exhibits from Natal comprise chiefly animal and vegetable substances used in manufactures. There are two or three collections of the indigenous woods, some fine samples of cotton and fibres, flax, &c.; three fine elephant's tusks, averaging 77 lbs. each; hippopotamus tusks; some very fine rhinoceros horns, and a beautifully arranged and interesting series of horns of the antelope tribe, the native oxen, &c. The Jury have awarded a medal to Topham, Brothers (*Natal*, 15), for polished specimens of native woods, and for a fine collection of horns; a medal to the Cotton Plantation Company of Natal, Limited, for samples from several bales of very fine cotton grown on their estates; honourable mention to T. Reynolds for Orleans or short staple cotton, and they would express the hope that Natal would persevere in the effort to grow cotton on a large scale, for which its soil and climate are so well fitted. Honourable mention is also made for the wool in the grease, the Angora goats' hair, and the woods shown by W. G. Baker (*Natal*, 1). In the Nova Scotia Court honourable mention is made by the Jury of the straw work shown by Mrs. Begg (*Nova Scotia*, 4), and of the flax exhibited

by Moyle (*Nova Scotia*, 52). In the Queensland collection the Jury have awarded a medal to J. Craven, Bradford, (*Queensland*, 1), for the very beautiful series of Australian wools, and the fabrics made from them, and honourable mention to the Queensland Emigration Board (No. 8), for the samples of cotton and silk shown. In the Victoria Court the Jury have awarded medals to the following exhibitors:—To Messrs. Cunningham and Macredie (*Victoria*, 98), for twenty-four very fine assorted fleeces of wool; to the Acclimatization Society (*Victoria*, 99), for samples of Angora goats' hair, and Alpaca wool; these, with other animals, they have been successful in introducing into the colony; to Mrs. A. Timbrell (*Victoria*, 100), for a fine collection of cocoons and spun silk, showing the adaptability of the colony for silk culture; to Alcock and Co. (*Victoria*, 101), for several fine polished slabs of blackwood, myrtle wood, and other colonial woods; to Anderson and Wright (*Victoria*, 103), for sample planks of red gum, boxwood, stringy bark, and blackwood. The Jury also commend, by honourable mention, a case of fleeces of Geelong wool, shown by Jacomb, Son & Co., London (*Victoria*, 2); and a collection of colonial woods shown by Dr. Mueller, F.R.S. (*Victoria*, 104).

Passing now to Foreign countries, the Jury have awarded to Belgian exhibitors, medals to the following:—To L. Claude (*Belgium*, 48), for pure Colza oil; to W. de Curte (*Belgium*, 49), for distilled stearine and candles; to Hansotte, Brothers and Sister (*Belgium*, 54), for fine glue; to J. C. Lambrechts and Co. (*Belgium*, 55), for soaps and perfumery; to J. Lefebvre (*Belgium*, 57), for prepared hemp and flax; to G. Luyckx (*Belgium*, 58), for prepared India rubber; to H. Mechant (*Belgium*, 60), for very finely prepared flax; and to C. Verbessem (*Belgium*, 63), for a fine collection of glue and gelatine. Honourable mention has been accorded to the following Belgian exhibitors:—To H. Delmotte (*Belgium*, 50), for prepared bristles; to P. F. De Naeve (*Belgium*, 51) for shoddy or artificial wool; to J. B. D. Durez (*Belgium*, 52), for perfumery; to Laurent, Brothers (*Belgium*, 56), for toilet and household soaps; to A. Maschelein (*Belgium*, 59), for raw flax; to Baron E. Peers (*Belgium*, 61), for flax; to C. Taulez-Bottelier (*Belgium*, 62), for flax; and to P. Verduyase-Braoq (*Belgium*, 64), for raw and prepared flax.

The Kingdom of Italy has sent a large and fine collection of raw produce, but owing to the want of identification by numbers agreeing with the Official Catalogue, and some confusion in the arrangement, the Jury found it impossible to reward many exhibitors who would clearly have been entitled to it. To the following awards they have, however, agreed:—Medals to the Catania Sub-committee (*Italy*, 186), for cleaned cotton; to the Barons Majorana (*Italy*, 196), for a fine collection of twenty-seven specimens of cotton in the seed, and ginned; to the Director of the Royal Museum at Turin (*Italy*, 204), for a fine collection of cottons raised in Italy, in 1863, by numerous cultivators, and shown at the first Cotton Exhibition held at Turin in 1864; to Professor Tornabene (*Italy*, 207), for a beautiful collection of 157 samples of cotton pods, with the dried plants and cotton wool, scientifically named and arranged, grown in the Botanic Garden at Catania. This collection includes samples raised from seed obtained from Russia, Greece, Turkey, Italy, Malta, Portugal, Egypt, Algiers, India, the United States, Jamaica, British Guiana, Brazil, New South Wales, and other countries; to Baron Donnafugata (*Italy*, 191), for some fine samples of cotton in the pod, and cleaned, grown on his estates at Ragusa; to Eugenio Hallaire (*Italy*, 194), bailiff to H.M. the Emperor of the French, for some fine samples of cotton and also madder, grown on His Majesty's private estate at Civitanova, being the first attempt to raise cotton in that locality, in 43° N. lat., close to the Adriatic. Considerable attention has been given to cotton cultivation in Italy within the last few years, and the kingdom now promises to be a large cotton producing country. In 1859, the first year in

which a stimulus was given to the culture by the government, the value of the cotton produced was but 50 millions of francs; in 1864 the value of the crop had reached 302 millions of francs. A medal has been awarded to Ferdinando Pizetti (*Italy*, 201) for an interesting collection of the moth's eggs, and cocoons of the Parmesan, Macedonian, and Bucharest silk worms. Finally, honourable mention is made of the whisks, brushes, and brooms made from the panicles of the broom corn (*Sorghum dora*), shown by G. Bacini (*Italy*, 183). A large trade is carried on in these and in brooms made from the creeping roots of the *Chrysopogon Gryllus*.

In the Netherlands collection a medal has been awarded to Messrs. Smits and Zoon (*Netherlands*, 37), for an interesting series of animal charcoal.

The "woodstuff," and samples of paper made therefrom, exhibited by C. A. Koether, Cassel (*Zollereins*, 65), and which have hitherto been included in Class XVII., belong more properly to Class IV., and have accordingly been transferred to that class. Many years ago several attempts were made to employ wood as a material for paper; among others Messrs. Hartmann and Schlesinger patented a machine for the manufacture of wood pulp from which much was expected. It was only, however, within the last fifteen years that the peculiar difficulties which wood offers to being converted into a good uniform pulp, free from lumps, and capable of flowing evenly on the gauze of the paper machine, have been successively overcome. Two manufacturers appear to have obtained this practical success, M. Chaudard, of Paris, and Herr H. Völter (H. Völter's Söhne, of Heidenheim, in Würtemberg. Mr. Völter, especially seems to have made wood one of the regular raw materials for paper, for several pulp manufactories on his system have been set up in Germany, France, and elsewhere.

Mr. Koether seems to work upon Völter's system. He exhibits samples of different qualities of "stuff" made from four woods—the linden, the aspen, the pine, and the Scotch fir. These samples, which are of excellent quality, are of very moderate price. He charges for 50 kilogrammes, or 110 lbs., the following prices:—Linden, aspen, pine stuff—No. 1, 5½ thalers (or about 16s.); No. 2, 4½ thalers (or about 13s.); No. 3, 3½ thalers (or about 10s.). Scotch fir stuff—No. 1, 4½ thalers (or about 13s.); No. 2, 3½ thalers (or about 11s.); No. 3, 3 thalers (or about 9s.).

The samples of paper made from mixtures of rags with different proportions of these "stuffs" are excellent, and show a decided progress in wood paper manufacture since 1862. Among them may be specially mentioned a good writing paper, containing 45 per cent. of Scotch fir stuff; an excellent tough lapping paper, containing 65 per cent. of the same material; and a coloured lapping tissue paper, which is exceedingly strong, containing 50 per cent. of woodstuff.

Mr. Koether deserves a medal for the excellence and cheapness of his woodstuff, which are worthy of the attention of our manufacturers.

WILLIAM K. SULLIVAN.  
CORR. VANDERMAEREN.  
P. L. SIMMONDS, *Reporter*.  
C. F. MOORE.

#### LIST OF AWARDS MEDAL.

##### UNITED KINGDOM.

71 HAWES, J. 7 *Adelphi terrace*, London, W.C.—For taste and skill in the preparation of skeleton leaves and seed vessels.

380 GANLY, SONS, & PARKER, *Usher's quay*, Dublin.—For excellent quality of samples of raw wool.

##### CANADA.

12 BRUNET, L'ABBÉ, *Laval University*, Quebec.—For a large and well-arranged collection of polished woods.

##### INDIA.

INDIA BOARD.—For a large and well-arranged series of raw materials.

##### JAMAICA.

1 JAMAICA COTTON COMPANY, 55 *Charing cross*, London, S.W.—For a good collection of cottons and fibres.

6 WILSON, N. *Island Botanist*, Bath.—For a large and beautifully-prepared collection of indigenous fibres.

##### NATAL.

15 TOPHAM, BROS. *Pietermaritzburg*.—For a fine collection of woods, horns, and other raw materials.

20 COTTON PLANTATION COMPANY OF NATAL (LIMITED), 6 *Great St. Helena*, London, E.C.—For some fine specimens of cotton, grown on their estates.

##### NEW SOUTH WALES.

3 HUGHES, H. P. & SON, 10 *Basinghall st.* London.—For excellent quality of superfine clothing fleece.

4 SIMES, J. T. & Co. 53 *Colman st.* London.—For excellent quality of their samples of Australian and other Colonial wools.

##### VICTORIA.

98 CUNNINGHAM & MACREDIE, *Melbourne*.—For twenty-four very fine prize fleeces of wool.

99 ACCLIMATISATION SOCIETY OF VICTORIA.—For Alpaca and Angora goats' hair.

100 TIMBRELL, Mrs. A.—For a fine collection of cocoons and silk.

101 ALCOCK & Co. *Melbourne*.—For polished slabs of wood.

103 ANDERSON & WRIGHT, *Melbourne*.—For sample planks of colonial woods.

148 TURNER, J. H. *River Yarra*, *Melbourne*.—For excellent quality of washed wool.

##### BELGIUM.

48 CLAUDE, L. *Brussels*.—For pure colza oil.

49 DE CURT, W.W., *Gendbrugge*, near *Ghent*.—For distilled stearine and candles.

54 HANSOTTE, BROS. & SISTER, *Huy*.—For fine glue.

55 LANDBRECHTS, J. C. & Co. *Antwerp*.—For soaps and perfumery.

57 LEFÉBURE, J. *Brussels*.—For prepared hemp and flax.

58 LUTCKX, G. *Brussels*.—For prepared India rubber.

60 MECHANT, H. *Hamme*.—For very finely-prepared flax.

63 VERBESSEM, C. *Ghent*.—For fine collection of glue and gelatine.

##### ITALY.

191 DONNAFUGATA, BARON, *Ragusa (Noto)*.—For cotton.

194 HALLAIRE, EUGENIO, *Civilanova (Macerata)*.—For cottons.

196 MAJORANA, BROS. Barons of Nicchiara, *Catania*.—For collection of cotton.

204 ROYAL INDUSTRIAL MUSEUM, *Turin*.—For collection of cotton.

207 TORNABENE, PROF. F. *Catania*.—For large and well-arranged collection of cottons.

**NETHERLANDS.**

37 SMITS & ZOON, WED. P. *Utrecht*.—For fine collection of animal charcoal.

160 GORTER, H. A. *Dockum*.—For excellence of quality of flax and clover seed.

**ZOLLVEREIN.**

43A KORTER, C. A. *Cassel, Hesse*.—For the excellence and cheapness of his woodstuff for making paper.

**HONOURABLE MENTION.****BAHAMAS.**

1 RAWSON, H. E. the Governor.—For a fine collection of indigenous woods, fibres, &c.

**CANADA.**

MORRIS.—For good samples of flax in straw.

32 MILLAR, J. *Montreal*.—For hemlock bark and decoction for tanning purposes.

BACON, P. *Halley*.—For good quality of wool.

**JAMAICA.**

2 ROBERTS, E. B. 239 *Regent st. London*.—For a collection of sticks for umbrellas and walking sticks.

3 ROBERTS, G. 4 *Fenchurch st. London*.—For some fine polished specimens of Jamaica furniture woods.

**LAGOS.**

1 SIMMONDS, E. J. L. *Lagos*.—For a fine collection of African products.

**MAURITIUS.**

16 DUNCAN, J.—For a collection of fibres cultivated at Mauritius or indigenous, prepared by himself, and sent to the Exhibition by Prof. Bouton.

**NATAL.**

1 BAKER, W. G. *Pietermaritzburg*.—For a collection of woods.

19 REYNOLDS, T.—For samples of cotton.

**NOVA SCOTIA.**

4 BEGG, MRS.—For straw plait and straw work.

52 MOYLE, H. M.—For flax.

**QUEENSLAND.**

6 GOVERNMENT EMIGRATION OFFICE, 2 *Old Broad st. London*.—For samples of cotton and silk, and for good quality of samples of wool.

**VICTORIA.**

2 JACOMB, SON, & Co., *Basinghall st., London, E.O.*—For fleeces of Geelong wool.

104 MULLER, DR. F.R.S. *Melbourne*.—For a small collection of colonial woods.

110 DAVIS, FINLAYSON, & HUTCHESON, *Melbourne*.—For good quality of manufactured woollen socks.

138 ROWE, J. P. *Terrick-Terrick*.—For good quality of wool.

**BELGIUM.**

50 DELMOTTE, H. *Ghent*.—For bristles.

51 DE NAEYER, P. F. *Lebbeke, near Alout*.—For shoddy.

52 DUREZ, J. B. D. *Brussels*.—For perfumery.

56 LAURENT, BROS. *Waterloo, near Brussels*.—For toilet and household soaps.

59 MASCHELEIN, A. *Gheluwe, near Courtray*.—For raw flax.

61 PEERS, BARON E., *Oostcamp, near Bruges*.—For flax.

62 TAULEZ-BOTTILLIER, C. *Bruges*.—For flax.

64 VERCRUTSSE-BRACQ, F. *Deerlyk, near Courtray*.—For raw and prepared flax.

**FRANCE.**

34 AUGIER, A. *Marseilles*.—For good quality of oil for machinery and tools.

**ITALY.**

183 BACINI, GIOVANNI, *Lastra a Signa, and Florence*.—For brooms.

**NETHERLANDS.**

16J VANDER MEULEN, N.H. *Leeuwarden*.—For Friesland flax.

**CLASS B.—MACHINERY.***Report on the Machinery Department.*

BY JOHN STURGEON, *Superintendent.*

THE Machinery department of the Dublin International Exhibition, although limited in size and scope as compared with that of the Great Exhibition of 1862, nevertheless contains many objects of interest and importance, whether regarded as new additions to mechanical science (many of which contain the germ of important results), here for the first time brought under public notice, and destined, in all probability, to appear at some future Exhibition in a different character as fully established things—or regarded as *improvements only* on what has gone before—improvements, however, of scarcely less importance as to their results. Most of these would hardly win any notice from the general visitor, whose attention is caught only by objects of a striking character; and it is partly the aim of the present report to point out and explain those objects most worthy of special notice, which might otherwise be totally overlooked, or but slightly appreciated.

The Machinery is contained in a separate annexe, consisting of two compartments; the larger one, containing the Machinery in Motion, is 208 feet long by 96 feet wide; and the smaller one, containing Machinery at Rest, specimens of iron manufacture, &c., is 100 feet long

and 96 feet wide. The machinery is driven from three lines of polished shafting  $2\frac{1}{4}$  in. diameter. The two principal line shafts are carried overhead, in bearings attached to the iron pillars supporting the roof, and are driven by means of a 25-horse horizontal high pressure engine, manufactured by Messrs. Woolstenhulme & Rye, of Oldham. Instead of an ordinary belt, or gearing, for driving, motion is imparted to the line shaft by means of a series of six round leather bands (about  $1\frac{1}{2}$  in. diam.), running in suitable grooves in the rim of the fly wheel and the driving pulley on the main shaft, by which means a very steady, noiseless motion is obtained, with a strong transmitting power. This system of driving by frictional bands (on a principle similar to that of Robertson's frictional gearing) is a patent of Messrs. John Combe and Sons of Belfast. The third shaft is laid along the floor, and is driven by an eight-horse power horizontal engine, exhibited by Mr. Hackworth, of Darlington. For the convenience of exhibitors of engines in motion, steam is supplied at a pressure of 50 lbs. to the inch, through a line of steam pipes laid under the main passage, alongside of which is also placed a line of exhaust pipes leading into the chimney flue. The steam is supplied by three cylindrical boilers, two of which are in constant use, and the third in reserve. These boilers are each 5 ft. 9 in. diameter, and 20 feet long, with internal fires and flues, and were supplied by the engineering firm of Thomas Grendon & Co., of Drogheda. The feed water is supplied to them from a small tank by means of a Giffard's Patent Injector, supplied by Messrs. Sharp, Stewart, & Co. (Limited), of Manchester. At one end of the machinery court is fixed, on an elevated platform, an engine of about 25-horse power, which performs the duties of driving the pumping machinery, and also of transmitting a supply of cool or hot air, as occasion requires, throughout the building. Although this machinery serves no purpose of exhibition in the machinery department, yet a brief description of it may not be here out of place. The whole of the hydraulic machinery has been laid out under the direction of William Anderson, Esq., C.E., and constructed by the engineering firm of Thomas Grendon & Co., of Drogheda. There are three fountains in the gardens, the principal one of which is in the form of a cascade. For this cascade the water is driven through an 18-inch pipe (by means of one of Appold's centrifugal pumps), and caused to fall over the side of a basin placed at an elevation of about 30 feet. It is then received in a large semicircular basin at a lower elevation, from which it again falls, in the form of another cascade; after which the water finally disappears below the ground, being conducted back by pipes to a reservoir pond, ready to be pumped up again to the fountains. The front and sides of those basins are piled with massive rockwork, with various Alpine plants growing in every available spot. The quantity of water delivered through this cascade is 1,400 gallons per minute, at a maximum. A sluice valve is placed among the rockwork in the lower overflow, by means of which the flow of water can be regulated at pleasure or stopped altogether.

The other two fountains are placed in circular basins of 40 feet diameter, and are intended to consist of overflow cascades, similar in character to the one described. For the purpose of the present Exhibition, however, these fountains are in the jet form, the water issuing from a series of orifices in classically-designed vases. They may be worked either from a pair of slide valve pumps driven by the 25-horse engine referred to, or from a large tank placed upon the roof of the building. The return water from these two fountains will also flow into the reservoir pond, but not immediately, being compelled to do duty on its way in forming a stream issuing from a vase held by the water god placed in the middle of the pond.

It is also purposed, after the close of the present Exhibition, to place five other fountains in the conservatory, the basins of which are now, however, for the convenience of the exhibition, covered by the floor of the building.

Connected with the pipes supplying the fountains in the garden is a series of smaller pipes traversing the various gravel walks, and having hydrants or stand-pipes in connexion, so placed that every portion of the gardens can be watered by means of hose pipes and differently-formed jets, the hoses being arranged so as to admit of being connected to any of the hydrants at pleasure, by means of screw couplings, the hydrants regulating the flow of the water. The water is supplied to these pipes, when the pumps are not at work, by means of the tank before alluded to. This tank also supplies water at a considerable pressure to another series of pipes, traversing the whole interior of the building, and having hydrants in connexion in convenient situations; thus giving at all times an abundant supply of water, at high pressure, to be made available in the event of a fire.

The Machinery exhibited may be classified under the following heads:—

- 1st. Prime Movers; along with which may also be taken Steam Generators and Contrivances for economising the Consumption of Fuel.
- 2nd. Railway Machinery and Plant.
- 3rd. Machinery for preparing and spinning Flax.
- 4th. Woollen Machinery.
- 5th. Cotton Machinery.

- 6th. Silk Machinery.
- 7th. Looms.
- 8th. Engineers' Tools.
- 9th. Wood-working Machinery.
- 10th. Printing Machinery.
- 11th. Fire Engines and Pumping Machinery.
- 12th. Naval and Military Engineering.
- 13th. Miscellaneous.

The Agricultural Machinery, which forms a distinct section (Section IX.) is exhibited in the Royal Dublin Society's premises in Kildare-street, and will not be included in the present notice.

In Prime Movers the chief aim of all improvement is the economy of fuel. Simplicity of construction is, of course, a great *desideratum*, and is not lost sight of in modern engineering. But it is the saving of *fuel*—the food of the engine, and the great agent in all manufacturing arts—upon which all the thought, skill, and ingenuity of constructors of engines is now brought to bear. Heat is the primary source of motive power, and when we consider that the source from which England has derived her present greatness as a commercial nation is, in reality, contained in those immense stores of heat, so to say, made up into the consolidated and portable form called “fuel,” which she holds in her store-rooms beneath the soil, known as the coal beds, and that this fuel is constantly being drained away at the rate of about 90 millions of tons annually, at which rate of consumption England will in another century or so cease to be a coal-producing country; then, any improvement, effecting in however slight a degree an actual saving of this valuable material, becomes of national value and importance, and is a subject worthy the attention of scientific men. This, however, is a view of the questions affecting posterity only; and doubtless posterity would be left to take care of itself, were there not already sufficient motive for economising on account of the actual cost of procuring the material, which not only secures it against reckless waste, but even induces consumers of it to study the nicest economy in its use. The engine exhibited by Mr. Kay, of Bury, is designed with a view of obtaining the largest measure of power, with the least consumption of steam, and consequently of fuel; and an examination of a few of the beautiful indicator diagrams of the working of his engines would seem to show that no greater perfection can possibly be attained in the working of an engine. The curves of these diagrams are almost as perfect as if traced out mathematically true. The engine exhibited is a horizontal one of 45-horse power. The crank shaft is turned round by means of a small vertical engine of 6-horse power, so that the valves of the large engine may remain uncovered for the purpose of showing their action. There are two separate slide valves, one of which moves over the face of the other, and cuts off the steam at any required point, which may be varied at pleasure by means of a screw, which is also regulated by the governor. The valves are moving in opposite directions while crossing the ports, thereby insuring a sharp cut off, while the exhaust valve works in a separate chamber, giving a full and free exit to the exhaust steam throughout the stroke. In the engine exhibited by Mr. Hackworth, of Darlington, a single slide valve is used, the steam and exhaust ports being so arranged and set with regard to the slide valve, as to obtain the effect of the expansive action in a single valve. This engine is also supplied with a receiver, containing tubes heated by the exhaust steam from the engine, through which receiver the feed-water is caused to pass, and is thereby raised to a temperature of 220 degrees before entering the boiler; Mr. Hackworth estimates the saving of fuel by this engine at 25 per cent. There are several admirable peculiarities about this engine well worthy of notice, particularly the reversing gear, the manner of constructing the joints, &c., and other small details of construction. Besides the various arrangements for economising the consumption of steam in engines, modern constructors of engines are now very careful to reduce the loss of power from friction and other causes to a minimum, and study to avoid putting unnecessarily large masses in motion. No better examples of the perfection of construction in this respect could be given than in the two engines referred to.

One of the causes of loss and waste of fuel is the exposure of an undue extent of condensing surface. This is often neglected, though it is a matter not difficult to remedy by the application of some substance which is a non-conductor of heat. In the machinery department, where a large condensing surface could not be avoided, owing to the extent of steam pipes traversing the room to supply the various engines at work, it is estimated that a full saving of 12-horse power is effected by covering the pipes with hair felting. This is laid on in two courses, viz., a layer of bitumenized hair felting next to the pipe, after which a layer of ordinary hair felting, and lastly a wrapper of canvas, covered over with a coat of paint. This is the system employed by Mr. Hulse, of 32, Clarendon-street, Manchester; Messrs. James, Brothers, of Fish-street-hill, London, exhibit a non-conducting substance for the same purpose called “Spence's Patent Non-Conducting and Non-Combustible Composition,” which may be seen in the machinery at rest court.

Referring now to steam generators, there is a large drawing exhibited of a boiler on an improved principle called the "Field boiler," the peculiarity of which is in the introduction of a series of double tubes—external and internal—in the boiler, the use of which is to create a rapid revolution of the water through the tubes, thus bringing every particle of the water in the boiler over and over again into direct contact with the heating surface, the greater heated particles constantly making way for the less. Thus, instead of the heat having to make its way from the heating surface gradually and progressively through the water by the ordinary action of boiling, the cooler portion of the water is rapidly and constantly being *brought up* to the heated surface, and consequently a great saving of fuel effected in the getting up of the steam. Boilers of this description are applied to the steam fire engines exhibited by Messrs. Merryweather and Sons, in which the rapid generation of steam is a matter of much greater importance than the saving of fuel.

In this country the use of compressed peat as a fuel has lately begun to assume considerable importance, in consequence of the great success attained in the production of this material by machinery. Compressed peat contains about sixty per cent. of the heating power of the best coal, while the cost of the material is about fifty per cent. lower than the cost of best coal in this country, thus leaving a balance in favour of the peat. It is, however, probable that a suitable mixture of coal and peat may prove the best and most economical mode of application. It is much to be regretted that there was no suitable space available in the Machinery Court to exhibit one of the peat-compressing machines at work. Specimens of the fuel produced by the machine are, however, exhibited in Section I., Nos. 9 and 821.

There is another very important invention, bearing more directly on the question of fuel, and likely to modify to a considerable extent the calculations of Sir W. Armstrong, Mr. E. Hull, and others, as to the probable duration of our coal. At one of the meetings of the British Association, in September, 1865, Sir W. Armstrong stated, "that the most important invention of late years has been the cutting of coal by machinery." The invention of the coal-cutting machine has been, however, like most other great inventions, one of gradual development, although it is only recently that it has attained any practical success. Since the successful application by M. Sommeiller, at the Mont Cenis works, of compressed air as a motive power, peculiarly suited for working machinery in confined places, such as tunnels, and in coal mines, a very considerable impulse has been given to invention and improvement in coal-cutting machinery. There seems, however, to have been some difficulty experienced in getting these machines generally adopted in mines. This difficulty appears to have arisen partly from prejudice on the part of the miner against the use of the machine, and partly from the fact that the machines heretofore brought out were not perfect, but contained certain defects, in a great measure justifying the objections of the miner to their use. They did not supersede hand labour, but, on the contrary, had to be guided and worked entirely by hand, and required in their use a far greater exercise of skill, dexterity, and judgment, than was required to wield a miner's pick. Hence the necessity of an entirely *self-acting* machine became imperative. In another page will be found a full description of the self-acting machine introduced by Messrs. Carrett, Warrington, and Sturgeon, which appears to have overcome entirely the last remaining objection to the use of machinery for this purpose. Of the vast utility and importance of such a system of machinery there can be no doubt, when we consider that it will enable us to work economically those most valuable beds of coal lying at a depth of 4,000 feet, or more, which are at present inaccessible to the miner, in consequence of the great increase of temperature at such great depths. This increase of temperature amounts at a depth of 4,000 feet to 70 degrees. The compressed air machine, however, serves in itself as a most convenient ventilating and cooling apparatus, as the exhaust air issues from the machine at a temperature very little above freezing point, owing to a well-known law and condition of all airs and gases when expanding under a relaxation of pressure. All these important facts fully bear out Sir W. Armstrong's estimate of the importance of this subject, on which we have ventured to dwell so long on the warrant of his judgment. The proper application of heat as a source of motive power has been, we are convinced, as yet but imperfectly developed, and offers a promising field for scientific investigation. If our coal supplies were suddenly to fail, or fall short, it would at once become necessary to economize all the heat, from whatever source obtained. The immense quantities of heat wasted in flues and chimneys could no longer be spared, and all possible means of obtaining heat, and using it up to the best advantage, would have to be carefully studied. Although such an event is not likely to occur in our day, still it is evident that, if the matter was considered by engineers as if such a state of things were already impending, the result could hardly fail to be beneficial.

The only exhibitors of marine engines are Messrs. John Penn and Sons, and Messrs. Ravenhill, Salkeld, and Co. The former exhibit a small model of their trunk engine, and some beautiful specimens of machine work. The latter exhibit the working model of their oscillating marine engines—the same which they exhibited at the International Exhibition in 1862.

In the section of railway machinery and plant, a most valuable collection of useful and important inventions is exhibited. Indeed, it may be fairly said, that in this section there is really nothing of an inferior or mediocre character. Of all the improvements in the various departments in this section, perhaps the most important is the system of railway signals exhibited by the firm of Courtney, Stephens, and Co., of Dublin. Under the systems of signals at present in use, there is too much dependence placed on the judgment, intelligence, and promptitude of the pointsman and signalman, as is plainly evidenced by the large proportion of accidents occurring through mistakes in the management and working of signals. In Messrs. Courtney and Stephens' system—invented by Mr. Anderson, formerly of their firm—the various levers actuating the whole train of signals and points are so connected with, and made dependent one upon the other, that they are caused to alternately lock and release one another in the proper working rotation, which is determined by the previous setting of an index lever in accordance with the direction in which the train is moving or required to pass. The signalman cannot, by chance, move a wrong lever, as he will find all the levers locked, except the right one, which, when moved, releases, and so allows to be moved, the next in its proper rotation; so that a mistake is almost impossible. The security of the passengers is thus no longer left to hang in suspense upon the judgment and skill of one individual, who by a single error, slight in itself, might send hundreds to destruction; and science takes away from ignorance the power to do mischief.

Another cause of accidents on railways is the breaking of wheel tyres. The practice of shrinking on the tyre hot seems objectionable, as it places the tyre in a state of permanent strain and extreme tension, and in fact weakens the wheel, by rendering it more liable to fly when subjected to any sudden shock. Mr. Krupp exhibits specimens of plate wheels made entirely of steel, and which are, of course, free from this objection. These are fine specimens of material and workmanship. The Hörder Bergwerks and Hutten Verein exhibit wheels in which the tyre only is of steel, welded in one solid mass with the disc and nave, which are of wrought iron, the disc being of the corrugated or curved section. By thus forming a wheel with its rim only—the part subject to most wear—of steel, the material best calculated to stand wear, while the central portion, which is least taxed, is formed of a baser material, all the advantages of the solid steel wheel are secured, without its defects.

Mr. Ward, in the United States section, exhibits a model of an American passenger carriage, to which he has applied a most ingeniously-contrived brake, so arranged as to become self-acting, and take effect with unerring certainty in the event of one or more carriages breaking away from the rest of the train, or getting off the line. This is effected in such a way that the very cause of the danger becomes converted into the means of safety. By the use of such and similar contrivances to those above described, the many dangers and risks of railway travelling may be one after the other vanquished, until they are finally caused to disappear altogether. Mr. Ward also exhibits a system of air springs for railway carriages, the use of which is said to tend greatly to the comfort and ease of the passengers. He also exhibits a model of a self-centring railway turn-table, and a variety of other useful inventions.

Mr. Dering's "Permanent Way" is well worthy of attention. He dispenses altogether with bolts and nuts, wooden keys, &c., by substituting in their place powerful spring clips of tempered steel for the rail joints; and in place of holding-down bolts he employs treenails or hollow spikes, also of tempered steel. The tendency of these spring fasteners being always to close tight upon the rail or chair, their tenacity of hold is, of course, unaffected by variations of temperature. For the same reason, they are not liable to become loosened by the vibration caused by the trains in passing over the rails.

J. Spencer & Sons, of Newcastle-on-Tyne, exhibit railway springs, and other appliances; and Owens, of Rotherham, railway wheels and tyres. These are chiefly remarkable as being specimens of the very best style of workmanship, and are sufficient to afford some idea of the great internal resources of these firms for the production of first-class work.

There is only one locomotive exhibited, by the Dublin, Wicklow, and Wexford Railway Company. It is a fine tank engine, and was manufactured for the company by Neilson and Co., of Glasgow, who exhibit a case of photographs of locomotives made at their works.

The collection of flax machinery is by no means so varied and extensive as might have been expected, when we consider what an important part it holds in the manufacturing industry of Ireland. This, however, seems to have been due to the very prosperous state of this trade at the present time, which keeps the manufacturers too closely engaged with the serious business of executing orders to afford time or attention to bestow on an Exhibition. The firm of Hoey and Sons, of Chapelizod, near Dublin, exhibit the process of preparing and spinning flax on machinery manufactured by Farmer and Broughton, of Salford, near Manchester, and by Boyd, of Belfast; all the machines being good examples of the class. There seems to be but little room for improvement in this class of machinery, though it is still, perhaps, possible to obtain higher speed by means of improved arrangements in the various details in the

construction of the machines. In the earlier processes there is still much room for improvement. The scutching machines exhibited by Mr. Friedlaender, and by Messrs. Rowan and Sons, are the very best of the class. Still, the highest percentage of yield obtained on Mr. Friedlaender's machine was 29 per cent., while the average is only about 18 per cent. Much, therefore, remains to be done in these machines; but from the continued efforts of Messrs. Rowan and Sons, and of Mr. Friedlaender, the most satisfactory results may be confidently anticipated.

The woollen machinery, exhibited by only one firm—John Tatham, of Rochdale—occupies a very large extent of ground in the Machinery Court. Mr. Tatham exhibits the whole system of machinery used in the manufacture of cloth, from the earliest stage to the final weaving into cloth; the finishing processes are not exhibited. These machines contain all Mr. Tatham's latest patented improvements, which will be found more particularly described at another page. The process of manufacture is exhibited on these machines by Messrs. F. and R. Scott and Co., of Island-bridge Woollen Mills, near Dublin.

Messrs. Dobson and Barlow (Bolton), the only exhibitors of cotton machinery, have the largest amount of space of any exhibitor in this department. They exhibit machinery for the earliest stage in the preparation of cotton, viz., the ginning; and also their recently-patented improved spinning mules; the intermediate processes are not exhibited. Perhaps the most important invention of any in this department is the improved cotton gin exhibited by this firm. In almost all processes of manufacture, the first stage—the conversion of the raw material into a fit condition for undergoing the subsequent treatment by machines—is by far the most important; since upon it depends mainly the success of the subsequent operations, and the quality of the manufactured article; and at this time, when the continuance of national prosperity depends so much upon an adequate supply of cotton in a fit state for manufacture, any invention or improvement tending to effect that object must claim our best attention and regard. In selecting their gins to send to the Exhibition, Messrs. Dobson and Barlow appear to have been influenced by a regard to the importance of this subject. The duty of the cotton-gin is to clean and separate the raw cotton from the seeds. The governments of cotton-growing countries, having regard to the essential importance of this process in the preparation of the material, have offered large rewards for the production of a machine that shall answer the conditions of simplicity, cheapness, power of large production, and efficiency of work, as adapted to the requirements of the particular quality of the cotton. Messrs. Dobson and Barlow exhibit two of their improved cotton gins on their own patented principle, each of which appears to be very well adapted for its branch of work. The first of these is called the "Patent Roller Knife Gin." Its principle is that of a knife, or blade of steel, edged in a peculiar manner, wound spirally round a metal axle, to which a certain "traverse" is given. This knife works against a straight edge, and close to a drawing roller covered with a peculiar tissue. Immediately below the "knife roller" there is a wire fence, the interstices of which allow the seeds to pass through into their proper receptacle. The action of this "Roller Knife Gin" is very beautiful. The cotton supplied from above is gradually absorbed by the operation, and comes out in a regular and abundant stream of cleaned cotton. The fibre does not seem to be forcibly drawn, nor pressed, dragged, or crushed in any way, but somehow "*persuaded*" to part from the seed which holds it so tenaciously. At a recent series of experiments, it appears that a 40-inch "knife roller" cleaned 172 lbs. of seed cotton in one hour. A 30-inch gin, of similar construction, cleaned in the same time 104 lbs. of the same cotton: this staple was short; and, the seeds being green and thick, the operation of cleaning and saving the fibre was rendered very difficult; yet the yield of pure cotton was considered by the judges who were present very satisfactory, being at the rate of 25 per cent. of the raw material. The same machines cleaned, of a black seeded cotton, at the rate of 250 lbs. per hour, giving a yield of 40 per cent. of pure fibre. The other gin is termed a "Patent Double Cylinder Saw Gin." This appears to be a very efficient machine for treating short staples, as Surats, &c.; and is capable of cleaning 80 to 85 cwt. per day of ten hours, delivering it in the form of a continuous lap of perfectly clean cotton. An important feature in this gin is, that it is entirely self-contained, requiring no more space for its operation than a small carding engine, and gives out no dust; whereas in the most recently improved American machines two chambers are required—one for the gin to work in, and the other to receive the projected cotton and dust. Messrs. Dobson and Barlow also have a "Macarthy," or vertical knife gin—a machine which has been long before the public, and presents no new feature.

Messrs. Dobson and Barlow also exhibit two self-acting spinning mules, constructed on improved plans, recently patented by them. The whole headstock has been completely remodelled and improved.

The principal loom exhibitors are Messrs. Dugdale and Sons, of Blackburn. Substantial workmanship and good arrangement are the chief characteristics of the looms exhibited by them. The arrangement for stopping the loom on the breaking of the weft thread is applied to all their looms. A simple means of effecting the same object for the warp threads is much needed, and

would prove of great importance, as it would effect a great saving in attendance, by enabling one person to work several looms. The other looms are exhibited by the Greenmount Spinning Company, Dublin; and by Mr. Moss, of Balbriggan. Smyth and Co., of Balbriggan, manufacturers of the well-known Balbriggan hosiery, exhibit stocking looms.

The silk machinery exhibited by Mr. Murray contains some highly important improvements, calculated to produce considerable changes in the process of silk spinning. One of these machines is called a silk-throwing machine, which effects in a single operation the three requisite processes of spinning, doubling, and twisting, at a very high rate of speed. In the old system, the silk has to be placed on the first machine; then doffed, and placed on the second machine; then doffed, and placed on the third machine. By the new system, the silk has to be placed and doffed once only.

The following statement will give a comparative view of the advantages of the new system over the old:—

OLD SYSTEM.			NEW SYSTEM.		
Three separate Machines.			Only one Machine, performing simultaneously the three operations.		
Three distinct operations.					
Spinning, . . .	3,000 revolutions per minute.		Spinning, . . .	4,440 revolutions per minute.	
Doubling, . . .	3,000 " "		Doubling, . . .	3,000 " "	
Twisting, . . .	4,000 " "		Twisting, . . .	3,000 " "	
Total, . . .	10,000 in Three minutes.		Total, . . .	10,440 in One minute.	
COST.—No. 1.			COST.—No. 2.		
Spinning Machine, . . .	£100 0 0		Spinning, . . .	One Machine, about . . .	£130 0 0
Doubling, . . .	100 0 0		Doubling, and . . .		
Twisting, . . .	100 0 0		Twisting, . . .		
	£300 0 0		Capital saved, . . .		170 0 0
					£300 0 0

The patent doubling machine may be used with advantage for cotton, flax, or other fibres, as well as for silk. Its peculiarity consists in having the bobbins containing the material to be doubled, placed vertically, one over the other, on the same spindle, instead of being placed on the creel in the ordinary way; and thus—the giving-off spindle revolving as well as the taking-up spindle—the work is done in one-half the time as by the ordinary machine. This arrangement also enables the machine to be run at a higher speed than ordinarily, as the present objection to high speeds, viz., the liability of the thread to “corkscrew,” is entirely obviated by this plan.

The collection of engineers’ tools is only small, and limited to those of the lightest description. Sharp, Stewart, and Co., exhibit a few light tools. Their slot-drilling machine and Sellars’ patent screwing machine are excellent examples of design and workmanship. They also exhibit a large collection of photographs of their heavier tools.

Muir and Co., of Manchester have some excellent specimens of light tools, all of which possess points of particular merit. In their drilling machine, for instance, instead of the tedious process of winding up by hand, the drill spindle is raised quickly, by simply releasing a clutch, which allows a balance weight to run down and so raise the spindle. The arrangement of the table in this machine is also very good. In their slotting machine a good improvement is effected in the compound slides to the table, by the addition of two cross slides on the top of the circular slide—an arrangement which will be found very useful in many cases. Their patent foot lathe contains several good features; and their grindstone trough is already well known and appreciated.

Messrs. Courtney and Stephens, of Dublin, have a powerful lever punching and shearing machine, driven by a small independent engine attached to the frame of the machine. This machine will, no doubt, in time displace the ponderous double-sided punching and shearing machine in general use at the present time, as it requires not more than half the amount of metal, and occupies less space, in proportion, than those at present in use.

The Belgian firm of Cail, Halot, and Co., exhibit a collection of engineers’ tools, which appear remarkably similar in design to those of Fairbairn, of Leeds, and Sharp, Stewart, and Co., of Manchester, exhibited at the International Exhibition of 1862.

There is only one steam hammer, by Mr. Sturgeon, of Burley, near Leeds. This hammer embodies a new principle, viz., besides being self-acting, it is self-adjusting, to suit varying thicknesses, and delivers a clear blow, unrestricted by the back pressure of the steam admitted to raise the hammer after delivering its blow. In a series of articles in *The Engineer* on the self-acting hammers in the Exhibition of 1862, this was pointed out as being a necessary point to be attained in order to insure the proper value and efficiency of the self-acting principle in hammers. Grimshaw’s compressed air hammer is exhibited by Whitfield and Co., of Birmingham. In this

hammer the air is compressed by a pump worked by an engine, or from the line shaft, and admitted into the hollow frame of the hammer, which serves as a reservoir for it, and from whence it is admitted to the working cylinder by the action of the valves.

In tools for ornamental and fancy work, Messrs. Kennan and Sons, of Dublin, appear to follow very closely upon the well-known firm of Holtzapffel, of London, and may be considered as second only to them for that class of work. The collection of tools exhibited by this firm is certainly not inferior to any in workmanship or design. Messrs. Booth, Brothers, of Dublin, exhibit tools of the same class.

The collection of wood-working machinery is very fair. The exhibitors in this class are Messrs. Noble and Collier, of Halifax; C. Powis and Co., of London; Sketchley, of Weymouth; and Ryan, of Dublin. The tools are of the usual description. The universal joiner is a very useful tool, particularly applicable for use in remote localities, where it can be employed to cut the timber into the required form before transporting it, and thereby effect a considerable saving in cost of carriage. The lathe exhibited by Mr. Ryan is intended for turning simple ornamental forms in wood, such as chair legs—an operation which it performs with remarkable rapidity, completing its work in a single traverse of the cutters, which are guided by means of a copying template.

There is a fair collection of machinery for printers, bookbinders, and stationers. Mr. Salmon, of Manchester, exhibits a large collection of machinery of this class, most of which contain his recently-introduced patented improvements. Of these the "Eclipse" printing machine, the railway ticket printing and numbering machine, the numbering machine, the round-hole perforating machine, and the cutting machine, all possess features of peculiar merit, and will be found fully described in the catalogue. Messrs. D. and J. Greig, of Edinburgh, exhibit a very fine collection of machines for printers and bookbinders. Messrs. Hughes and Kimber exhibit, for the patentees, Messrs. Dawson, Payne, and Co., of Otley, printing and other machines. Mr. Forster, of Crow-street, Dublin, exhibits at work, for the patentee, Huguet's patent lithographic printing press; and the Official Printing Company, Dublin, have a fine platen machine at work, made by Long, of Edinburgh.

The exhibitors of fire-engines are, as usual, Messrs. Shand, Mason, and Co., and Messrs. Merryweather and Sons. The close competition between those two firms has resulted in the attainment of a high degree of perfection in these engines. In steam fire-engines the chief aim is to obtain the maximum of power with the minimum of weight, and to effect great rapidity in the raising of steam. Messrs. Merryweather and Sons have applied to their engines the "Field Boiler," which has been already referred to. An effort was made to organize a competitive trial between the two fire engines, at this exhibition, but the suggestion was not carried out.

The pumping machinery employed for the fountains and the exhibition building has been already referred to. Messrs. Courtney and Stephens exhibit slide valve pumps on their own patented principle. These pumps can be worked up to very high speeds, and have performed efficient service in the exhibition on several occasions of emergency. Messrs. Morton and Wilson, of Stockton-on-Tees, exhibit one of Wilson's patent ship pumps. This pump is a beautiful specimen of design and workmanship.

Although "Naval and Military Engineering" forms a distinct branch, having its own allotted department in the exhibition, yet there are several examples belonging strictly to this class in the machinery court. Of these the two guns exhibited by F. Krupp, of Essen, are the most remarkable. The largest of these is a 110-pounder, rifled on the Armstrong principle, but differing from the Armstrong gun in the improved breech-loading arrangement, and in being composed of homogeneous hammered steel. The other is a small 9-pounder gun, manufactured on the same principle, but with a different kind of rifling; this gun can be loaded and fired with great rapidity. Captain Norton exhibits a new gun, with the oval bore rifling. The "core" for the casting having been turned in the lathe, the bore is found to be so perfect when cast, that it does not require to be bored out by machinery. For this gun Captain Norton recommends hollow elongated shot, of a diameter equal to the lesser calibre of the gun; so that the explosion may expand out the hollow portion of the shot, causing it to take the form of the bore, which imparts to it the required rotary motion on issuing from the gun.

Mr. Ward, in the United States department, exhibits his admirable system of international ship telegraph signal, for which he received a prize medal at the exhibition of 1862. He has also a small bullet-making machine, capable of making 3,000 bullets per hour. The bullets made by this machine are remarkable for their perfect accuracy of form and equal balance.

Under the head of "Miscellaneous" must be included several machines, which belong to a class of themselves, but of which there are only one or two examples shown. Among these we may refer particularly to the cask-washing machines exhibited by Messrs. Robinson, of Bridgewater, and Davison and Scamell, of London; also the self-acting mashing apparatus of Mr. Maitland. The action of this little apparatus is very beautiful and effective. The grist falls

from a shoot into the machine, where it is met by a series of jets of hot liquor, acting with sufficient pressure to delay the progress of the grist through the machine, dashing it from side to side until it becomes thoroughly mashed, and finally issues from the mouth in a continuous spiral stream into the mash tub. Messrs. Morton and Wilson, of Stockton-on-Tees, exhibit a refrigerating apparatus, on their own patented principle; also a mashing apparatus, steam impermeator, and a variety of other apparatus. Messrs. Davison and Scamell exhibit a very ingenious apparatus for rapid drying or heating, called a "Thermantereon."

Mr. Hunter's slate or stone-cutting machine deserves particular notice, as it is a machine which will be found highly serviceable in the important stone quarries of Ireland. In some experiments with this machine in the Exhibition, upon some remarkably hard stone, quarried on the estate of Mr. Reeves, Kilrush, the edges of stone slabs, two inches thick, were trimmed and squared at a rate equal to two feet per minute, or 1,440 lineal feet per day of twelve hours. Blake's patent stone-breaking machine, exhibited by Mr. Marsden, is an exceedingly useful machine for contractors, and well worthy of notice. Also Amos and Francis' patent sword-arm slate-dressing machine, exhibited by Easton and Amos.

Southall and Heap's boot-machine is a remarkably ingenious and effective machine; but could be greatly improved by increasing the strength and solidity of the framework. Great steadiness and solidity are necessary to the production of good work in all machinery subject to shocks and vibrations, which tend not only to produce irregularities in the work turned out, but in time to damage and shake loose the working parts of the machine itself.

The models of iron roofing and other iron structures exhibited by Turner, of Hammersmith Iron Works, Dublin, will give some idea of the nature and extent of the works which have been executed by this firm, who have successfully competed against English firms in many important works erected in their own country. The model of the rolling bridge for railways and roadways (Turner and Gibson's patent) is worthy of notice, as the principle has been carried out with success on several lines of railway, and is likely to come into more general use.

We have thus endeavoured to point out some of the objects particularly worthy of notice in the Machinery Court; and in doing so must necessarily omit lengthened notices of many objects of value and importance, but which scarcely need an explanation of their particular merits. We will, therefore, simply make mention of the brass work, &c., exhibited by the Broughton Copper Company, by Messrs. Morton and Wilson, Stockton-on-Tees, and by Curtis, of Dublin. The lap-welded tubes, by Russell, of Wednesbury; the bitumenized paper pipes, by Carl Fuess, and Co., Hamburg; Chatwood's intersected steel plates, for safes; the pressure and vacuum gauges, engine-counters, &c., by Schäffer and Budenburg; the dioptical water-gauges, by Carré, exhibited by Mr. Leblanc; and the silent fans, by Freeman and Grundy. These are all well worthy of notice, as specimens of fine material and workmanship, and ingenuity of design and construction.

It is scarcely necessary to remark upon the advantages of exhibitions for promoting and advancing science and art, as this has been fully proved by past experience. We may, therefore, confidently expect that this Exhibition will do its fair share in the way of opening up fresh fields for investigation and improvement, the results of which cannot be estimated from the size or scope of the Exhibition itself, but may even exceed in importance those of larger and more attractive exhibitions.

[Mr. Sturgeon estimated the value of the Machinery, &c., shown in the Machinery annexe at £23,900. This was exclusive of the agricultural and horticultural machinery (Section IX.) shown in the Royal Dublin Society's premises, Kildare-street, and of the fire engines and various other articles exhibited in different parts of the building, and which came under the head of Class B, Section VIII.]

## SECTION V.—(A.)—MACHINES FOR DIRECT USE, AND MACHINERY IN GENERAL, AT REST.

**72 D. F. LEBLANC, London.**—Dioptical water gauge tubes for steam boilers.

The common glass tubes used for the water gauges of steam boilers are subject to two great evils:—first, frequent breakage, often resulting in accident; second, the difficulty of reading off the true level of the water in the boiler, in consequence of the darkening of the sides of the tubes.

The frequency of breakage is avoided by the use of brass casings which completely protect the glass tubes, or by even entirely superseding the glass tubes, by means of tubes of metal in which are fixed glass lenses, of such diameter and thickness that a rupture can occur but seldom, and that, even then, the projection of the piece of glass is nearly impossible.

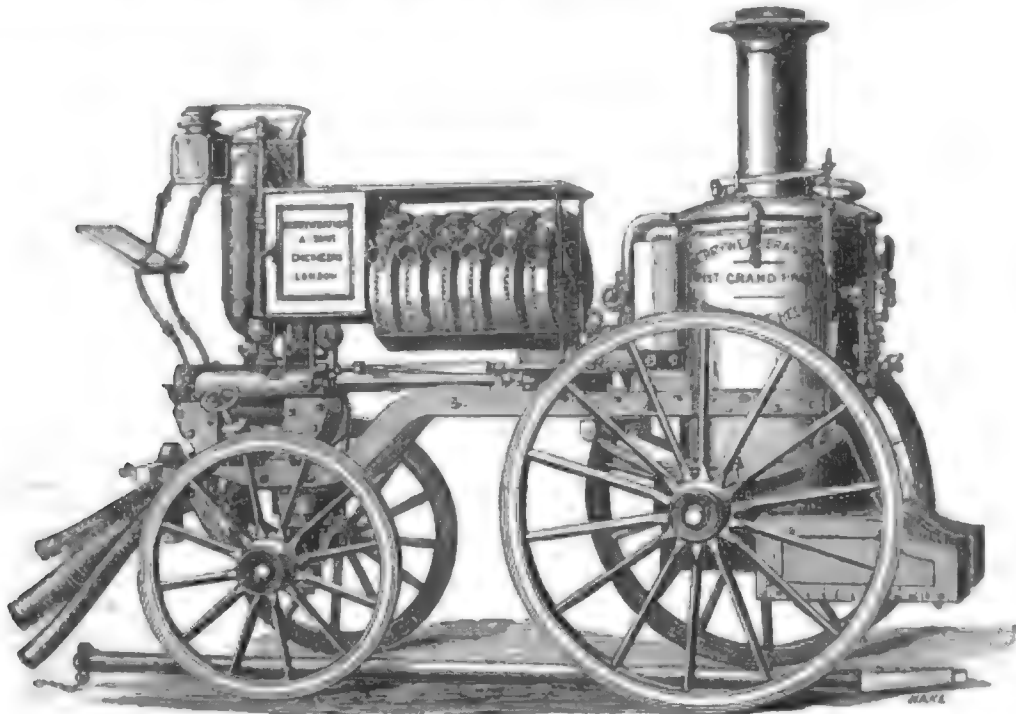
The combined optical properties of glass and water are utilized with a view to render the presence or absence of the water in the tube more perceptible, and to thus remove the difficulty experienced in reading off the true level, when the sides of the tube happen to be darkened.

A rather thick-sided glass tube can be looked upon, when empty, as a cylindrical lens, which is the double equivalent of a spherical lens, scientifically termed in French "menisque concave" or "periscopique concave;" when filled with water, however, the glass tube gets to be the equivalent of a bi-convex spherical lens. From this it follows that the holes in the casing appear, in the part containing no water, under the form of an ellipse, the major axis of which is parallel to the axis of

the tube, while the portions full of water show a transverse ellipse.

"On the efficiency of the water gauges with which they are fitted depend the safety and durability of thousands of steam boilers. The ordinary glass water gauge leaves little perhaps to be desired. It has one or two defects, however, which it is worth while to remove. The first is, that it is very liable to fracture, not perhaps from the pressure of the steam within—for a well-seasoned glass tube will last for months, or even years—but from violence without. Where an inferior class of men are employed as stokers, as in the mining districts, we find, for example, that the glass tube is seldom used, the float taking its place. But the greatest objection to the use of the simple tube lies in the fact that there is no means of determining with certainty whether it is full or empty. Thus a boiler may be many inches too full while the gauge may appear quite empty; and again, the gauge may be thought full while the top of the fire box is being burned out. M. Carré, of ice-making celebrity, has, we think, duly overcome these objections in the dioptical water gauge. The principle involved is really very simple, and extremely efficient; and we have no hesitation in pronouncing the improved gauge as ranking among the very best in the market."

**73 MERRYWEATHER & SONS, Long Acre and Lambeth, London.**—Steam and hand fire-engines, hose, buckets, belts, hatchets, fire-escapes, &c.



Improved Patent "First Grand Prize" Steam Fire Engine.

"The First Prize" (£75), Cologne Exhibition Competition, June, 1865.

"The First Grand Prize," Crystal Palace, London, July, 1863.

The Netherlands Prize Medal, 1864.

The Netherlands' Money Prize, 1864.

The Prize Medal, International Exhibition, 1862.

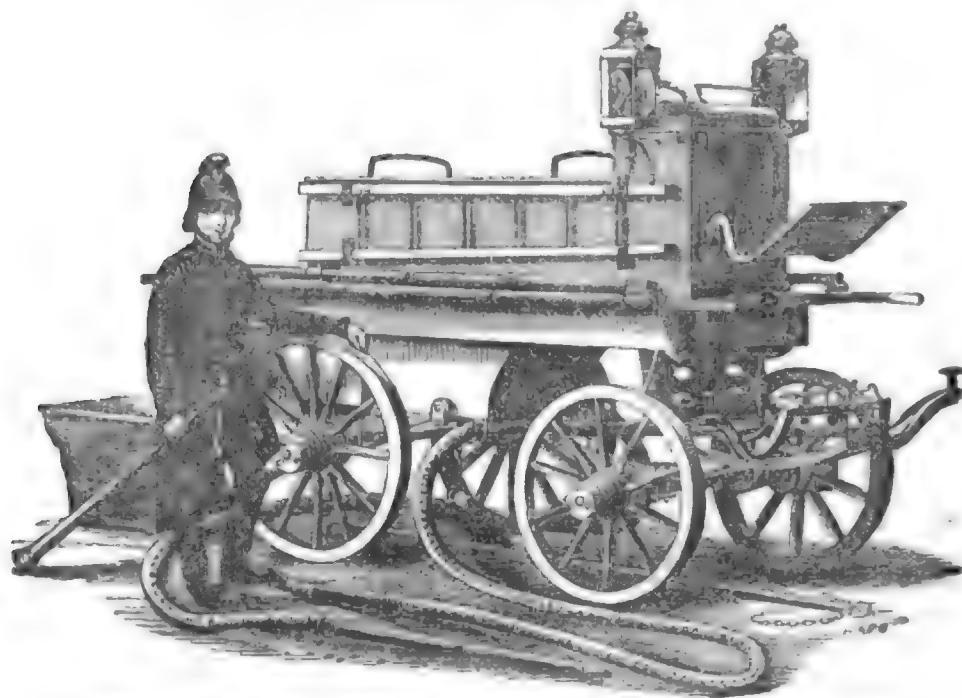
The Prize Medal, Paris Exhibition, 1855.

The Prize Medal, Great Exhibition, 1851.

At the last competitive trial (Cologne), one of these

Steam Fire Engines raised steam from cold water to 100lbs. pressure in 7½ minutes. These steam fire engines, of which there are six sizes, three with double and three with single cylinders, are the most simple and durable, have long strokes of pistons, and work at a less speed than all other steam fire engines.

They are used by the British, French, Spanish, Dutch, and Belgian Governments, &c.; Fire Brigades in London, Liverpool, Newcastle, and the provinces; Holland, Germany, West Indies, &c.



Improved "First Prize" Brigade Fire Engines, of five various sizes and powers,

Used by the London, Liverpool, Manchester, &c., Fire Brigades, by Her Majesty the Queen, His Royal Highness the Prince of Wales, the various Fire Brigades in the provinces and throughout the world, insurance companies, railways, docks, factories, &c., Her Majesty's and several foreign Governments.

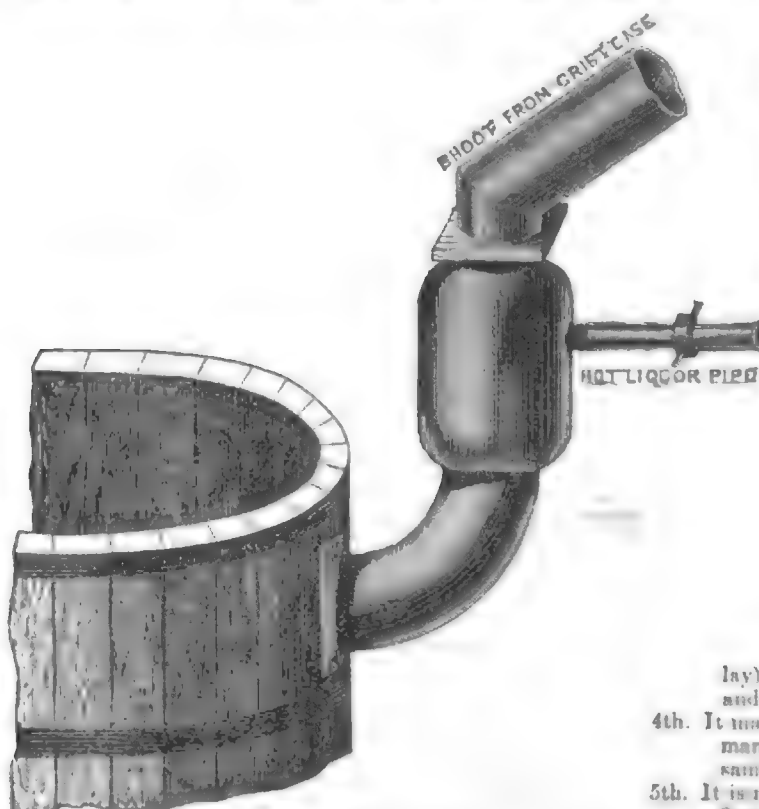
Fire Engines for mansions, plantations, factories, docks, Volunteer Fire Brigades, of all descriptions and for every climate.

Steam Floating Fire Engines, fire escapes, fire cocks,

hydrants, hoses, and buckets of every description; firemen's helmets, belts, hatchets, &c., and everything connected with fire extinguishing.

74 CURTIS, W. & SONS, 25, 26, 27 and 28 Chancery lane, and 99 Middle Abbey st.—Self-acting lubricator for engine cylinders; oil syphons; brass steam cocks; valves, steam whistles, pumps, &c.

75 MAITLAND, CHARLES, Alloa, N. B.—Patent self-acting mashing apparatus, for the use of brewers and distillers.



Patent Self-acting Mashing Apparatus.

This, the first Patented and most perfect self-acting mashing apparatus, is now in successful operation in about 200 of the largest breweries and distilleries in the United Kingdom.

The apparatus consists of a copper cylinder, with a jacket, into which the hot liquor pipe enters. The grist is admitted at the top, from a hopper, and as it descends it is thoroughly mashed by the action of the liquor, which is thrown in upon it by a number of jets, acting vertically and horizontally.

The following enumerated advantages, which, by practice it is found to possess, constitute it in every respect the most complete mashing apparatus extant:—

- 1st. From its simplicity of construction, and from there being no moving parts in it, it cannot get out of order or choke up.
- 2nd. It is entirely made of copper, is small and easily fixed.
- 3rd. Being self-acting, no motive power is required (thereby saving an usually large outlay), and nothing but the connexions of malt and hot liquor are required to it.
- 4th. It mashes in a most complete and satisfactory manner. Every grain of malt receives the same heat, and no flour is lost.
- 5th. It is much lower in price, and costs far less to fix than any other mashing machine hitherto made.

It may be fixed on the side of the tun, as shown above, or on the top, to suit situations.

The machine is manufactured by Henry Pontifex and Sons, coppersmiths, founders, engineers, millwrights, &c., 55, Shoe-lane, Holborn, London, E.C.; and by Robert Meiklejohn and Son, Alloa, who are the only parties authorized to supply this apparatus.

**76 RUSSELL J. & SONS, Church Hill Tube Works, Wednesbury, Staffordshire.**—Patent lap-welded iron tubes, steam cocks, &c.

**77 GOODISSON, T. H., 6 Serpentine Avenue, Sandymount, Dublin.**—Models of locomotive engines.

**78 GREG, D. & J. Fountain House Works, Edinburgh.**—Paper cutting machine; lithographic press; fast printing platen machine; lever cutting machine; screw presses.

**79 HIBERNIAN GAS METER CO. LIMITED, Dublin.**—Gas meter.

**80 SPENCER, J. & SONS, Newcastle-on-Tyne.**—Railway springs, buffers, &c.

**81 BOOKER, T. W. & Co. Melin Griffith Works, near Cardiff.**—Wire rods, cable, sheet, plate, button, and charcoal "letter" iron; tin plates.

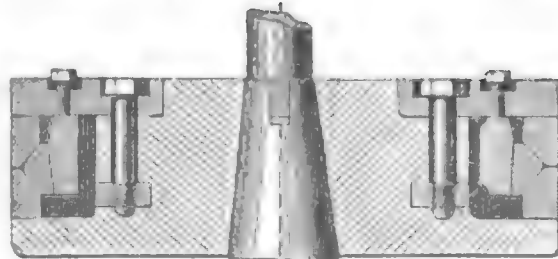
**82 BYRNE, J. I, Barrow st. Dublin.**—Byrne's patent adjustable governor.

**83 TURNER, W. Hammersmith Iron Works, Dublin.**—Models of Turner and Gibson's patent rolling bridges for railways and roadways; patent breech-loading cannon; iron roofs, greenhouses, &c.; photographs of works designed and executed by the firm.

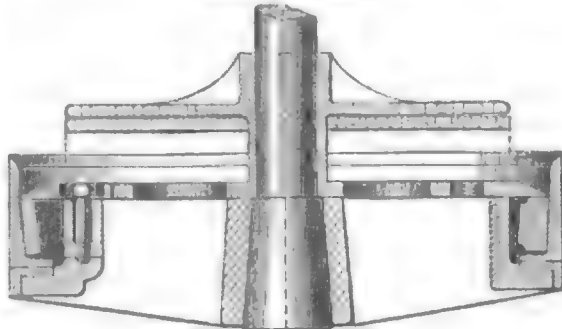
**84 CLAYTON AND GOODFELLOW, engineers and millwrights, brass and iron founders, Atlas Works, Blackburn.**—Metallic pistons and air pump buckets.

Notwithstanding the large number of metallic pistons of novel construction which have of late years been introduced to public notice, Messrs. Clayton and Goodfellow have perfected and patented a piston which is of a very superior style of workmanship, and comprises every first class characteristic. In calling attention to the diagram above it will be seen that it can easily be adjusted without taking to pieces, as the cylinder or piston wears, while it renders the escape of steam during the stroke impossible. The amount of friction is reduced to a minimum, thus effecting a saving in fuel,

**87 SHAND, MASON & Co., Upper Ground-st. Blackfriars road, London.**—Steam and hand-worked fire-engines, hose, suction pipes, firemen's accoutrements, &c.



Section of Piston.



Section of Bucket.

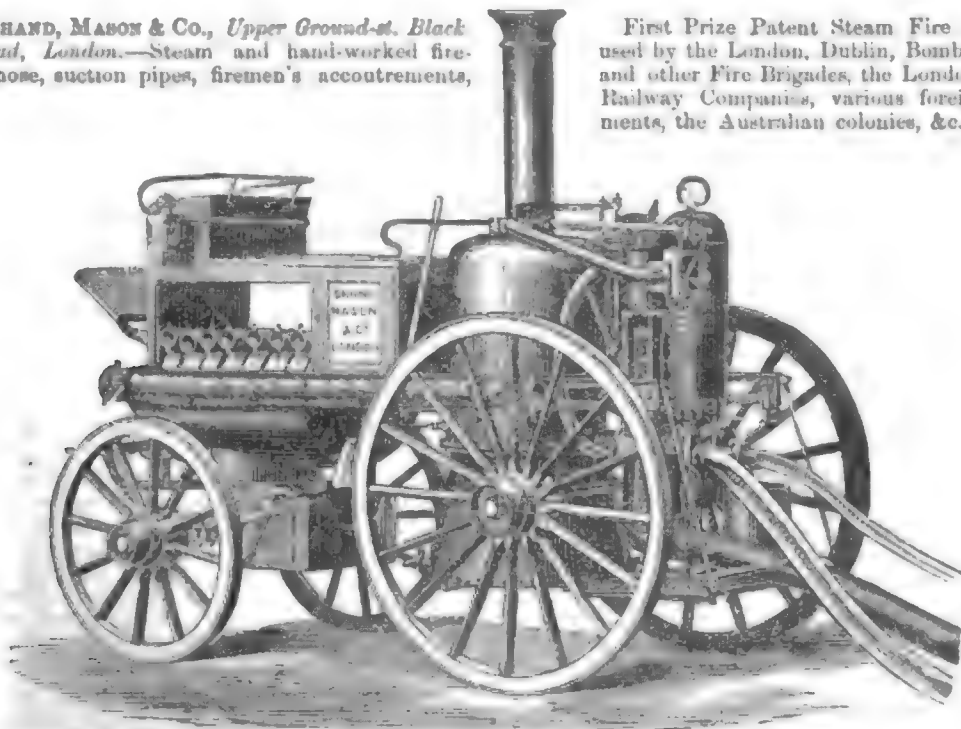
durability, and power. It is simple, easily cleaned, and, with ordinary care, will not get out of order.

They have also patented a metallic bucket suitable for air and other pumps; it is considered by engineers to be the best bucket made. From the principle of its construction, no dirt or grit can pass between the working surfaces, thereby saving the expense of frequently re boring the barrels. The friction is light compared with others, and is perfectly water and air tight, which greatly improves the vacuum, and, where condensing engines are used, effects a great saving in fuel.

Cylinders and air pumps of any diameter or length are re-bored without removal.

**85 WISE, F. Chandos Chambers, Buckingham st. Adelphi, London, W.C.**—Drawing of "field boiler."

**86 JAMES, BROTHERS, 15 Fish st. Hill, London, E.C.**—Spencer's patent non-conducting and non-combustible compositions, for covering boilers, &c.



Shand, Mason and Co.'s Steam Fire Engine.

First Prize Patent Steam Fire Engine, as used by the London, Dublin, Bombay, Sydney, and other Fire Brigades, the London Dock and Railway Companies, various foreign governments, the Australian colonies, &c. With this

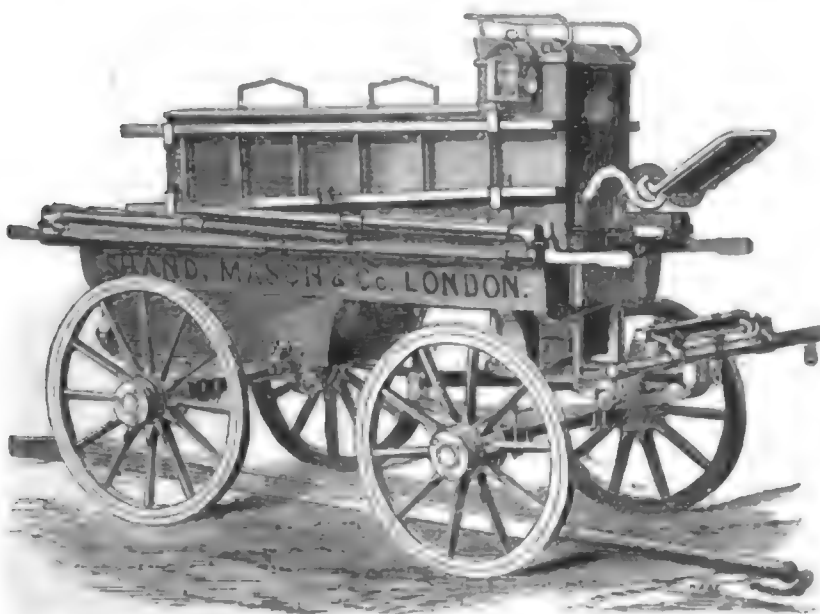


water pressure in the fire-engine apparatus. The framing of the engine is formed of two metal tubes placed longitudinally, and forming receptacles for branch pipes, stoking irons, or other articles; to these tubes the boilers and hind springs are fixed. There is also a sheet metal trough in front on the under side, to which the plate of the locking carriage is fixed; and on the upper side a tool box, with driving seat and footboard, and seats for firemen; under this box is a receptacle for hose, which can be placed in coils or wound on a reel. The steam boiler is placed in the front of the hind axle, and the steam and fire engine apparatus at the back, but fixed to the boiler; this admits of better access to all parts of the engine. The hind springs are made of steel plates in the usual manner, but combined with spiral springs and india rubber stops to provide a better action and to reduce weight. There is a footboard in two pieces at the back, on which the man travels, and attends to the fire. When the engine is in use, these boards are placed one on each side of the boiler to screen the hind wheels from the heat. There is a furnace door in front, and a coal bunker fixed to the fore locking carriage.

"The second part of this invention relates to improvements in the construction of the steam boilers of steam fire engines, such boilers being applicable to other purposes. The steam boiler is of vertical tubular construction, and the outer shell surrounding the tubes is cylindrical. Two detached semi-circular chambers, made of thin sheet metal, are used to fill up the space between the tubes and outer shell; these chambers communicate with the steam space by means of tubes (two or more), and to the external atmosphere by cocks fixing the chambers to the shell of the boiler; these cocks are used to empty any condensed steam that may accumulate in the chambers; the use of the chambers is to reduce the quantity of water in the boiler, causing steam to be raised more rapidly, and to increase the steam space. The chambers may be of any shape and number, and are applicable to boilers other than those of steam fire engines. The boiler is also constructed so that the upper part of the shell may be detached by means of bolts, or studs and nuts, thus allowing complete access to the tubes and internal part of the boiler.

"Fig. 1, in the accompanying engraving, is a longitudinal section, showing the construction of the boiler, steam engine, and pump. The fire box A is of conical form, so as to give space for a large fire grate or furnace.

The fire box communicates with the smoke-box B, and the chimney by the vertical tubes C. In order to diminish the water space and increase the steam space, two semicircular metal cases or pockets D are fitted into the boiler round the space occupied by the tubes C. The casing D communicates with the steam space by two or more open pipes E, which ascend above the water level, and small cocks (not shown in the drawing) are fitted in the bottoms of the cases D through the sides of the boiler, to draw off any water that may be formed by condensation. The upper shell of the boiler can be taken off by means of the bolted joints F and G; and the top of the smoke-box can be taken off to repair the tubes, &c., by unscrewing the joint H. The engine is composed of an inverted steam cylinder I, placed above and concentric with a pump K, which parts are framed together by the four bars L, which connect the enlarged head of the pump with the cylinder bottom, and which frame L also carries the bearings for the crank shaft M. The pump is fitted with india rubber discs, which form the foot valve. In action the suction is drawn in the up stroke by the bucket O, and in the down stroke about half the water is discharged by the displacement of the plunger N, and at the next up stroke the remainder of the water is discharged by the ascent of the bucket. The enlarged head of the pump K is fitted with a large air vessel Q, and nozzles to take the hose at R. Over the openings to these nozzles at S is fitted a valve, shown in plan at Fig. 3, which is so constructed as to admit of both outlet passages being open, or to close either at pleasure, but not to close both outlet passages at the same time. The connecting rod T is jointed to the bottom of the pump plunger N, which is itself attached to the steam piston by two piston rods, between which the crank works, as shown in plan in Fig. 2. Upon one end of the shaft crank M is keyed a fly-wheel, and upon the other end an eccentric, which works the slide valve and the feed pump V. Fig. 4 is a section of the governor, which is constructed with a piston fitted into a cylinder, with a trunk and stuffing box; the connecting link from the piston is attached to the lever of the regulator, the pipe W is connected with the steam jacket of the cylinder, and the pipe X with the enlarged head of the main pump, so that any change in the pressure of the water in the pump will cause the piston of the governor to be moved by the pressure of the steam, and thus regulate the admission of steam to the steam cylinder of the engine."



Shand, Mason, and Co.'s Hand-worked Fire Engine.

First Prize Volunteer Brigade Fire Engine, as used by the London, Dublin, Edinburgh, and other Fire Brigades, the various Insurance Companies, the Volunteer Fire Brigades, British, Foreign and Colonial Governments, &c.

Prize Medal, Great Exhibition, London, 1851.

Prize Medal, International Exhibition, London, 1862.



**Muir's Cast Iron Surface Plate, 30 in. X 20 in.**—This plate is made to stand upon three bearing points, and is scraped up perfectly true with the scraping tool. It is a very beautiful and accurate piece of work, and rivals in smoothness a sheet of polished glass. The process by which these plates are produced, and through which such minute accuracy is obtained, is as follows:—First, three cast iron plates are truly planed to a level surface in the planing machine. The tool marks are then filed out from all three, and the surface of each is then coated with a composition of raddle and oil, so that when the plates are placed in contact, and rubbed about one upon the other, the high parts are indicated by marks on the prepared surface. These high parts are then reduced by the scraping tool; the surface is again prepared as before, and the process repeated, but this time with the surfaces crossed and rubbed in a contrary direction. The operation is still

continued, crossing and interchanging the plates each time, and reducing the high parts as before described by the scraping tool, until they are at length all reduced to an equal bearing, and made so true that after being wiped clean and placed one upon the other, the contact is so perfect that they will lift one another by the force of the pressure of the atmosphere, there being no air admissible between the surfaces in contact. They become, in fact, united like one solid body, but can be easily separated by sliding the one off the other. Three surface plates are thus produced. These plates are used as standards by machinists and engineers, and are specially applicable for producing air or steam tight valves, or surfaces requiring to be perfectly flat. They are fitted with handles for the convenience of lifting, and are strongly stayed to prevent springing. They are made of any size or description to order.

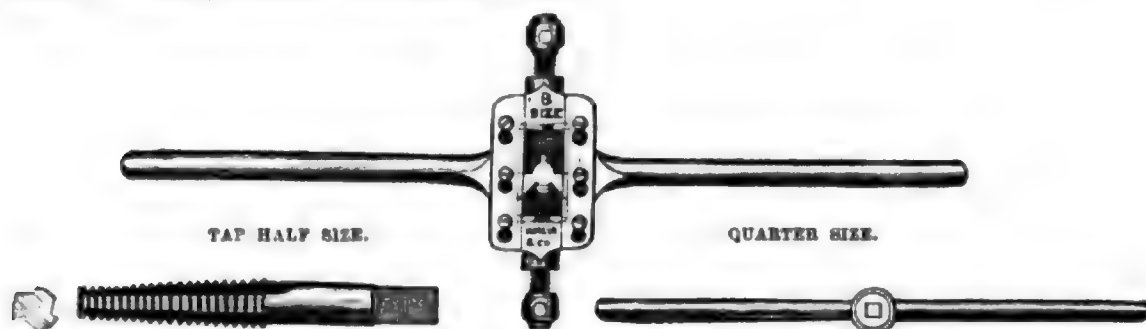
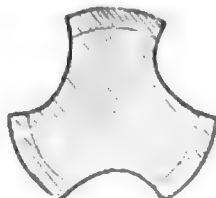


Fig. 6.—Muir's Screw Stock, and Screwing Tackle.

**Fig. 6.**—A complete set of improved Screwing Tackle. The dies are made so that one will serve as a guide, and the other as a cutter, which can be ground on a grindstone. The taps are fluted in a superior form for cutting; the cutting edge is a radial line through section of tap, which is found by experience to take about one-third less power than taps that have hitherto been in use; they are made to standard gauges. The angle of the thread is  $55^\circ$  for all diameters, rounded both at top and bottom.



Section of Inch Tap.

**157** CARR, T. *Richmond road, Montpelier, Bristol.*—Patent levigator Mills.

**158** DUBLIN, WICKLOW & WEXFORD RAILWAY CO. *Dublin.*—Locomotive engine "Banshee."

**159** NEILSON & CO. *Glasgow.*—Photographs of locomotive engines, &c.—(See Mr. Sturgeon's Report.)

**160** OWENS' PATENT WHEEL, TIRE & AXLE CO. (LIMITED), *Phoenix Iron Works, Ro'herham, Yorkshire.*—Wrought iron engine driving wheel centres; waggon wheel centres; Owens' solid cast-steel tires.—(See Mr. Sturgeon's Report.)

**161** COURTNEY, STEPHENS & CO. *Blackhall place, Dublin.*—Railway fastenings, fittings, &c.; Anderson's patent junction signal work; Culverwell's patent paraffine railway lamp; Corlett's patent continuous-surface supported iron way; Corlett's patent fish-joint chairs; Corlett's patent water circulating forge tire; Spencer and Corlett's patent waggon and carriage buffing springs; Alcock's patent cushion springs.—(See Mr. Sturgeon's Report.)

Amongst the objects in this section particularly worthy of notice were the numerous specimens of iron work, including machinery of various kinds, exhibited

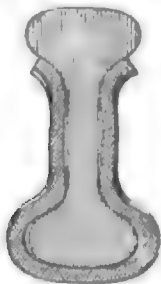
by Messrs. Courtney, Stephens, and Co., the well-known engineers of Dublin. The variety and excellence of the articles manufactured by this firm, and the great extension of their trade within the past few years under the present able and energetic management, afford a conclusive proof that in the important branch of industry comprised under the term "Iron Foundry," Irish manufactures can compete with those of England. There is scarcely any article of iron-work used on railways that Courtney, Stephens, and Co. do not manufacture, and in the construction of girders for railway bridges especially, they have acquired high reputation. In this matter they have overcome English competition, and we believe that the greater number of iron girders now and for years past used for railway bridges in Ireland have come from their establishment. They exhibit a large quantity of railway fittings, including rails, bolts, nuts, screws, rivets, buffers, &c., &c., and a large bar of iron showing the stages of manufacture by which forgings of wrought iron are produced out of scraps. First, there is a pile of loose scraps, the material of which the best wrought iron is composed; then we see a mass loosely welded together, and, as it is more thoroughly compacted by the blows of the sledge hammer it grows smaller and smaller until we have at the end of the bar a polished plate of the finest iron. A specimen of a spur wheel, moulded by machinery, and cast by a new and inexpensive process, introduced by this firm, is worthy of notice; as are also Mr. Culverwell's patent paraffine railway lamps. These lamps are used extensively on the principal railways in the United Kingdom and on the Continent, and have been found most successful. The roof lamps especially are highly creditable to the ingenuity of Mr. Culverwell, who has succeeded in overcoming the difficulty of ventilating them, which has hitherto proved a formidable obstacle to the use of paraffine oil in the lighting of railway carriages. Courtney, Stephens and Co. also exhibit a slide valve pump, invented by Mr. James Baskerville, foreman of their establishment. It is very compact, and takes up but little room. The valve arrangement is simple and so effectual in its action that nothing can get in so as to interfere with the motion of the machine, which is not liable to get out of order. They also exhibit a

steam punching and shearing machine of an improved description, of their own design and make. This machine is thought a great deal of; they have manufactured a great many of them for England. In the court for models is a model of a railway lattice bridge over the river Ovoca, County Wicklow, made in card board by their draughtsman, Mr. J. C. Heely. The bridge is manufactured by Courtney, Stephens and Co. It has a span of no less than 126 feet, and is of peculiar interest to engineers as being one of the few bridges of this description, constructed strictly according to theory. The calculated deflection of this bridge was given to the Government Inspector before he tested it officially, and it corresponded exactly with the actual deflection. Mr. Heely's model of Ovoca bridge has been most accurately made to scale, so that all the proportions of the structure can be clearly seen. We also notice a complete junction signal apparatus, with distant signal, &c., patented by Mr. W. Anderson, C.E., and termed the "Jacquard" system of signals, as the idea was taken from that beautiful and simple spinning loom. Messrs.

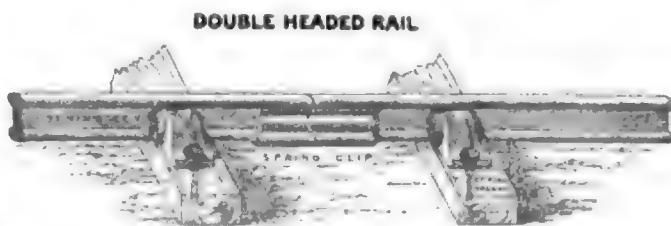
Courtney, Stephens, and Co., have erected with great success these signals in every part of Ireland, and on several railways in Wales. Their certainty and simplicity constitute their chief recommendation; all the signal posts are made of metal, thus accounting for their beautiful light appearance. They also exhibit a nicely finished drawing and made model of the patent sheer legs of Day and Summers, the well-known engineers and iron ship builders at Southampton. The simplicity of these sheers is nearly beyond belief; all the usual gearing of large sheer legs is completely dispensed with, owing to the back legs working in a horizontal screw, worked by a small pair of engines, which also give motion to the drum. The 100-ton sheer legs of the Southampton Docks are a noble specimen of this principle, and are correctly represented here by the present model and drawing.

162 WEIR, G. & J. *Glasgow*.—Model of patent compound governors.

180 DERING, GEORGE E. *Lockleys, Welwyn, Hertfordshire* (inventor and patentee).—Improved permanent way of railways.



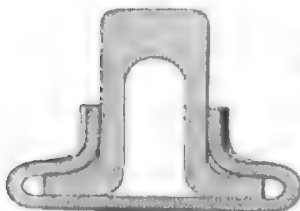
Section of Spring Clip Joint.



DOUBLE HEADED RAIL



Section of Clip when not expanded by the Rail.



Section of Spring Clip Joint



BRIDGE RAIL.

(Dimensions of Spring Clip, 12 to 16 in. long  $\times \frac{1}{4}$  to  $\frac{3}{8}$  thick.)



Section of Clip when not expanded by the Rail.



Spring Clip and Key Joint.



SPRING KEY.



Section of Spring Key and Chair Joint.



SPRING

TREAIL.



Spring Clip and Wrought Iron Key Joint

Received, at International Exhibition, 1862, the only Jurors' Award given for Improvements of Permanent Way, and also the Prize Medal in Dublin Exhibition, 1865.

1.—Spring Clip Fish-Joints, of tempered steel; affording the advantage of increased strength and smoothness at the joint, by reason of the powerful and uniform pressure of the spring clip. Any wear or loosening that may at any time occur is immediately repaired by the inherent tendency of the spring clip to collapse. Safety, simplicity, and economy are likewise insured by the absence of bolts, nuts, &c., and of the necessity for constant attention and labour which they entail—one single piece of metal taking the place of the ten or fourteen separate parts which constitute the ordinary "fish-joint." The spring clip, in combination with the spring

key described below, or with a key of wrought iron, forms a superior joint, and one very quickly made and taken to pieces.

2.—Spring Keys, of tempered steel; the most important advantages of which consist in the firmness with which they hold the rails, and that whilst possessing every qualification of the wooden key, without its defects, they are calculated to last at least ten times as long. The spring key never becomes loosened by vibration, owing to its unfailing tendency to expand, and is totally unaffected by hygrometric changes. It may be used either with intermediate or joint chairs; and forms,



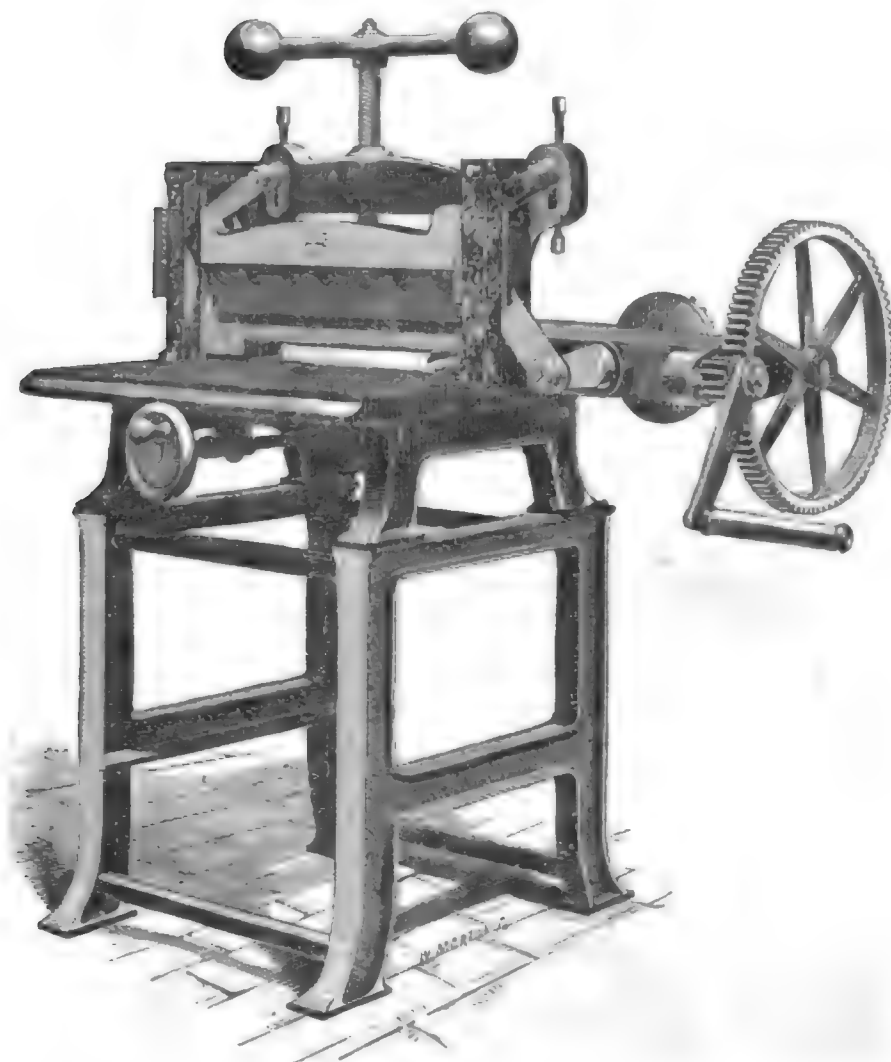


Fig. 2.—Furnival's New Patent Universal Job and Label Cutting Machine.

(Purchased by Browne and Nolan, Nassau-street, Dublin.)

This machine is an improvement upon Furnival's cutting machine for labels and jobs, the edges of books, cards, &c., and has been produced to meet the demand of the trade generally. It is on the principle of the guillotine, the blade descending vertically, but with an oblique cut. By the fly-wheel attached there is great power given, so that the most obstinate material is cut through with the utmost ease.

Prices	Without stand	With stand
To cut twelve inches,	£15 0	£17.
„ sixteen „	£18 0	£20.
„ twenty „	£22 10	£25.

Each machine is supplied with one knife; extra knives 2s. per inch. Fly-wheel, extra, 20s.

The same patented machine can be supplied with extra power and fly-wheel, of the undernamed sizes and prices:—To cut twenty-six inches, £55; thirty-two inches, £65; thirty-eight inches, £75; forty-two inches, £96; forty-four inches, £105; forty-six inches, £115; and forty-eight inches, £125.

Each machine is guaranteed, and supplied with two knives.

Fig. 3 is an Upright Paging Machine, with iron stand, mahogany rising table, inking apparatus, and tape

movement; works consecutively, alternately, and repeats twice or three times; roller mould, &c., complete. The price £28.

Extra set of wheels for the above, £6; five wheels are a set; extra wheels, each, 20s.

No. 1 is a hand machine, on wood stand, polished, with mahogany rising table; works consecutively, alternately, and repeats; with each is sent a set of clicks, roller mould, hand roller, and iron inking table to screw to frame; is suitable for paging books or numbering cheques, having a slot in back to pass the sheets of paper. Price £15.

Extra set of wheels for the above, per set, £5; five wheels are a set; extra wheels, each, 15s.

	Price.
No. 2 is a Hand Machine without stand, with rising and falling table,	£12 12
No. 3 as above.	
No. 4 is a Treadle Machine, with two sets of figure wheels for numbering cheques,	£45 0
No. 5 is a Treadle Machine, with three sets of figure wheels for numbering cheques,	£52 10



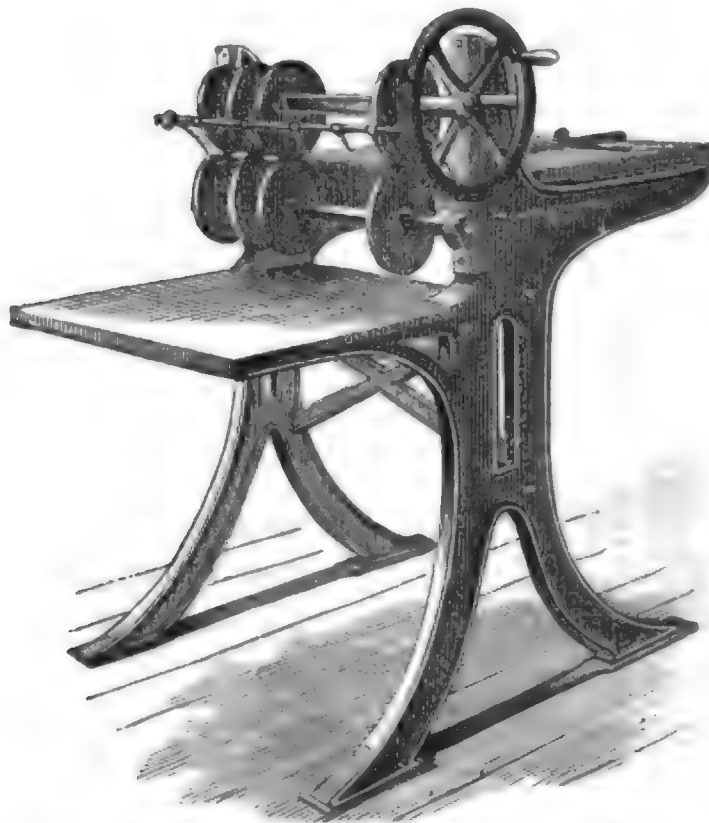


Fig. 5 will take a sheet 2ft. 6in. wide, and of unlimited length.  
(Purchased by Browne and Nolan, Nassau-street.)

The want of a quick and neat method of perforating has long been felt, and various machines have been introduced, but with very unsatisfactory results to the purchasers and to the public. The round hole perforation, as in postage stamps, has met with the most general approval, as being the neatest, and at the same time the most certain to sever; but the time occupied to effect this is very considerable, particularly where several lines of perforation are required, or in ticket books of several tickets deep, where the lines of perforation have to be stopped—most of the machines for this class of work requiring the removal of some of the punches. To meet this twofold want, the patentees have retained the neatness of the round hole combined with immense speed in effecting it, this machine requiring no alteration, and the speed being exceedingly rapid.

In Fig. 4 machine the perforating wheels are fast upon the shafts, and cannot be taken out of gear, which is not at all necessary in this machine. The machine is quite self-contained, and cannot get out of order when used by the most careless person; for whether standing straight or crooked, or in whatever position it may be placed, it will do its work equally the same. It is also open at the side, and will take a sheet of paper of almost unlimited breadth, as well as unlimited length. In the diameter of the wheels, punches, guides, &c., it is the same as the larger machines, and will fully meet the requirements of a large number of printers. It is beautifully polished, and would be an ornament to a shop.

In Fig. 5 machine the wheels for effecting the perforation are placed upon triangular shafts, and can be moved and adjusted to any distance between 2 feet 6 inches, which is the length of the shafts. Each wheel is 7½ inches in diameter, round which 300 steel punches are placed; these work into 300 corresponding steel holes contained in the lower wheel. The paper or card is fed to a guide, as in a ruling machine; the punches immediately gripe it, and carry it between the wheels, and the perforation is effected without the slightest

effort, the paper being cut clean out; and the small particles passing through the lower wheel fall under the machine. The sheets are taken off the punches by guides, and fall upon the table at the opposite side of the machine. The perforation can be stopped at any distance without any alteration, by simply reversing the handle. It will be seen, therefore, that any number of lines of perforation can be effected at one time, according to the number of perforating wheels placed upon the shaft; also that any wheels that are not wanted can be thrown out of gear. The sheets in passing through keep perfectly straight, and can be depended upon for working at press same as ruled sheets of paper in book headings. The machine is quite easy to turn, and can be worked by a boy or a girl; and the motion being rotary and continuous, the lines of perforation can be made either long or short at the option of the operator, and the sheets can be perforated as fast as a person can feed the machine. In books requiring the perforation to be stopped, as in ticket books, delivery books, and the like, with a machine of four wheels (same as the engraving), a ticket book of 500 leaves, and five tickets deep, requiring a line of perforation up the centre with four branches of perforation from it, can be done in 20 minutes. Of course, if there were more lines of perforation, it would only occupy the same time, but would require more perforating wheels. The machine is not liable to get out of repair; the punches are quite flat on the face, and are made from the best of steel, and the whole machine well and accurately fitted up. It can be driven by steam power if required.

Fig. 4 machine, with one set of wheels, polished, and mahogany table, elegantly got up, suitable for a front shop, £15 15s.

Fig. 5, with one set of wheels complete, allowing the wheels to be moved in any part of the shafts, £25; two wheels, £40; three do. £50; four do. £60; five do. £70; six do. £80; seven do. £90; eight do. £100; nine do. £110; ten do. £120; eleven do. £130; twelve do. £140.





is turned exactly one-tenth of its circumference in the same direction, by one reciprocating stroke, or one revolution, made either to the left or to the right. Each wheel, having completed one revolution, turns the following 1-tenth of its circumference, and each having a dial with 10 figures, of which one is only visible at the time; the first or next to the lever (a) indicates units, the second tens, the third hundreds, and so on. When all figures are nine, the next stroke or revolution converts them all to zero.

PRICE LIST OF COUNTERS :—

4 figures counts up to	10,000	£2 13 6
5 do.	100,000	3 0 0
6 do.	1,000,000	3 7 6
7 do.	10,000,000	3 15 0

One of these counters is applied to the Exhibition engine.

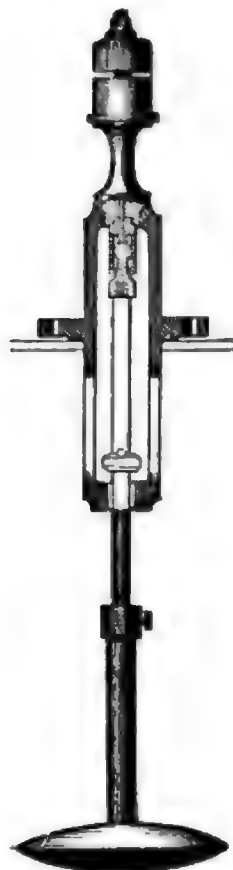


Fig. 5.—New Improved Low Water Indicator.

This apparatus is provided with float and whistle; it is an excellent indicator of low water in steam boilers, and particularly distinguished by its simplicity of construction, and certainty of action. A small ball which has play for moving free, and cannot stick fast, shuts off the access to the whistle, when the water in the boiler is at its proper level, and when it lowers, the float follows, causing the whistle infallibly to give the alarm.

**190 MOORE & MANBY, Dudley, and 3, Billiter-square, London, E.C.**—Specimens of rolled malleable and cold blast pig-iron; puddled and cast-steel, &c., &c.

**191 LONDON INDIA RUBBER CO. LIMITED.**—India rubber belting, piping, rings, &c.

**844 FREEMAN & GRUNDY, Manchester.**—Patent portable silent fan, for sanitary and ventilating purposes; patent portable forge, for boiler makers and contractors.—(See Mr. Sturgeon's Report.)

**845 DEAS, J. Edinburgh and Glasgow Railway.**—Patent switch-box.

**846 CARR, T. Bristol.**—Patent disintegrator.—(Agricultural Hall, Kildare st.)

**847 CHATWOOD, S. Bolton.**—Wedgeproof fastenings for safes; valve screws, springs, and cylinders; steel plates, &c.

**848 WALKER & SON, Birmingham.**—Beer and water meters; harpoon ship log; harpoon sounding machine.

**849 INHOTSON, W. 8 Dickinson-st., Manchester.**—Steam engine; California pump; patent pulley blocks.

**850 NUTMAN, L. Dublin.**—Several models.

FOREIGN DEPARTMENT.

**851 DINWENDAH, R. W. Huttrop, near Steele, R.P.**—Centrifugal mine ventilator for moving by hand.

**852 DRESLER, J. H. Siegen, Westphalia.**—Ring of rolled iron wire.

**853 BOCHUMER IRON FOUNDRIES, Bochum, Westphalia.**—Mine ventilator for moving by hands—system Rittenger.

**854 HÖRDER BERGWERKE UND HÜTTEN VEREIN.**—Hörde, Westphalia.—Railway wheels, showing the various stages in the development of the plate wheel system; large steel plate; rails; specimens of iron, &c.

**855 MARTINOTTI, LUIGI, 9 via Barbaroux, Turin.**—Portable flying bridge; look-out tower; fire escape.

**856 KRUPP, F., Essen, Rhenish Prussia, and 11 New Broad-st. London, E.C.**—(No. 191, Zoll.)—Steel 110-pounder gun, with improved breech-loading apparatus; small breech-loading gun; steel rail bent in three; steel plate wheels; photographic view of Krupp's cast-steel works at Essen.

Before alluding particularly to the articles exhibited by F. Krupp, of Essen, Rhenish Prussia, it may be somewhat interesting to give some idea of the vastness of the works, ranking as they do among the largest in the world, and certainly the most extensive by far of any works devoted entirely to the production of cast steel and objects manufactured therefrom. These works have gradually increased from a small factory, employing some 40 hands, and devoted then principally to making what are termed lace rolls, this being a speciality requiring rolls of extreme fineness of surface, as they are used for rolling out the gold wire for making bullion lace. The works have since then grown to an immense extent, and articles of a much greater variety are now produced, among which are specially, tyres, axles, springs, plates, guns, shafts for steamships, rails, rolls, &c. They employ at the present time about 10,000 men, and occupy in workshops and melting houses, &c., nearly 500 acres of ground. There are about 20 miles of railway on which 4 locomotives and 150 waggons are in daily use, bringing in the raw material and carrying away the finished products. In 1864, in the steel works alone, and exclusive of the blast furnaces and coal mines, there were employed 6,000 men. There were in operation in the same year 350 smelting, heating, and puddling furnaces, 136 steam engines, varying from 4 to 1,000 horse-power, 34 steam hammers from one to 50 tons weight, 110 smithies, and over 500 turning and other machines. The products are sent to all parts of the world, and, last year, exceeded 50,000 tons. The special work now going on at Essen is tyres and axles for railway use; and there is hardly a line in the whole world where these tyres are not running, and their great durability and consequent economy experienced. This has been evidenced recently by a set of 5 feet tyres running on the Great North of Scotland Railway, under a 28-ton engine, over 109,000 miles, without being tooled since they came from the maker's shops. This is considerably more than the whole life of best iron tyres. These steel tyres are made without a weld and by a method which insures that the steel is thoroughly well worked under the hammers. The wheels of the class exhibited were cast in one piece, and are becoming very extensively used under waggons. These works have also turned out some very large ship's intermediate and cranked shafts for sea-going steamers, which are exclusively used by the steamers leaving Bremen and Hamburg for America, the Austrian Lloyds and other



was in contact with the breech and the other face in contact with the side of the circular recess: so that when the gun was discharged the gas entered the circular recess and forced the two faces of the angle ring tight up against the breech and the side of the recess, and completely prevented the gas from escaping. The valve is kept in its place by a locking apparatus. This system has been very severely tested at Woolwich with perfect success, and has also been submitted to and adopted by continental governments, more particularly Russia. Guns up to 15 inch diameter of bore are being made at Essen in very large quantities, but it would occupy too much space to enter into all the details of the experiments that have been made. Sir William Armstrong and Company are now lining a great many guns with tubes made by Mr. Krupp. The ponderous masses that have to be handled at Essen have rendered it necessary that the proportion of the tools should be proportionately increased, and it is in contemplation to put up hammers weighing 125 tons: and indeed this has now become essential from the large ingots that are being daily cast. A short time since an ingot of 45 tons weight was cast to form the material portion of a 15-inch gun; and to properly forge this even the 50-ton hammer is considered too small, as it entails much longer time and causes the ingot to be too often heated for profitable working. There is but little doubt that the steel-makers of this country are greatly indebted to Mr. Krupp for the energy he has devoted to the manufacture of steel, and its application to a variety of purposes. Steel is now entirely superseding the use of wrought iron in those parts of machinery where great toughness, elasticity, and durability of wear is required. There is hardly a locomotive used which is not running on steel tyres, and the introduction of steel rails is becoming daily of more consequence. The steel produced at Essen is all melted in plumbago crucibles, and formed into the ordinary ingot moulds, this process employing a large number of men. For the large ingots of 30 and 40 tons and upwards, from 1,000 to 1,300 men are employed at one time, occupying in the casting from 8 to 12 minutes. The whole of the work, of whatever shape, that is turned out at Essen is made from these ingots, which are heated and forged until the desired density and form are attained.

At the London Exhibition of 1862 Mr. Krupp was awarded a medal in Class I., in recognition of the astonishing advance made by him in the production of large homogeneous masses of cast steel. In 1851 the metallurgical world could scarcely believe in his great block of 4,300 lbs. In 1862 there was a mass of no less than 40,000 lbs.; besides cast-steel tyres, and axles, and guns, and sheet, bars, and slabs variously broken to exhibit the beautiful and equally-grained texture. In Class V. Mr. Krupp was also awarded a medal for the excellent quality of his cast-steel axle-trees and solid wheels. In class VIII. a medal for steel (their trophy) for excellent workmanship and material, practical success and general excellence. In Class XI. a medal for his cast-steel ordnance. The jury stated that they considered them of so important a character as to deserve special notice at their hands. The remarkable features of the collection were the enormous size of the castings and forgings, and their perfect soundness and uniformity of temper as shown by the fractures. In this respect Mr. Krupp is at present far in advance of other manufacturers. Mr. Krupp then exhibited specimens of cannon and rollers beautifully finished; also cast steel railway wheels, tyres, and a variety of other large steel forgings.

857 CAIL, J. F. HALOT, A & Co. *Brussels*.—Radial boring machine; three slide-lathes; transverse planing machine.

858 UHLHORN, D. *Grevenbroich, near Düsseldorf, R.P.*—Cards for weaving.

859.—ZAPPA, LUIGI, *Milan*.—Fire engine.—(*Agricultural Hall, Kildare-st.*)

859A WARD, W. H. *Auburn, New York, U. S.*, and 75 *Hatton Garden, London, E. C.*—Models of self-centr-

ing turntable. American railway passenger carriage; a complete system of night, day, and fog signals; bullet-making machine; self-adapting unwrought trunk handle.

1. Self-centring Railway Turntable.—This turntable contains all the essentials of durability and strength. The upper, or revolving platform, and the lower or fixed portion, are provided with circular rings forming guides or tracks, between which run a series of spherical tread-wheels, carried in a suitable framework, the upper or revolving table resting upon these rollers, which, in turn, rest upon and run in the fixed circular guide, or track, or tramway underneath. Three of these rollers form guiding wheels, and are arranged so that they can be varied by the attendant to alter the wearing surfaces in contact; the rest are mere bearing wheels. The central pivot is thus entirely done away with, and the table can be turned round with only a slight exertion of power.

2. Model of an American Railway Passenger Carriage.—The first feature of novelty and improvement in this carriage consists in the application of air springs instead of steel or India rubber. These springs are applied directly over each of the axle-bearing journals, and support the whole carriage with ease and steadiness, being entirely free from all tendency to jumping or oscillation. They have also the effect of deadening the noise from the wheels, thus enabling the passenger to read, write, or converse with freedom. Another improvement consists in the application of an improved brake, by means of which an enormous pressure can be instantaneously applied to the wheels by merely pulling a string. The apparatus consists of a weight attached to a rope or chain, one end of which is wound round a spiral wheel on a vertical shaft, which is held in position with the weight at the top by means of a dog acting in the teeth of a ratchet wheel. By pulling the string the dog is released, allowing the weight to descend, which thereby imparts a rapid revolution to the vertical shaft. This motion is employed to draw in a chain, by which motion is imparted simultaneously to a series of cams acting upon the brakes between each set or pair of wheels. It is evident that in proportion as the pressure requires to be increased, the power also is increased, as well by the accelerated velocity of the falling weight, as by the increased leverage gained by the increasing diameter of the spiral wheel, as the rope or chain unwinds. The advantage of these breaks consists in their usefulness to prevent collisions, when danger is observed ahead, or when the carriages leave the rails, in which latter case the brake becomes self acting, the very cause of danger being thus converted into the means of safety, as in the case of the miners' safety cage. This apparatus can be applied to any carriage at a very trifling cost. Another novel and useful appliance is attached to this carriage, viz., a fresh and foul air ventilator. The fresh air, or receiving ventilator, is fitted with a small water trough, which collects and separates the dust, sparks, &c., from the in-current, admitting the fresh air to the carriage pure, and free from dust, while the exhaust ventilator carries off the foul air, the whole operation being effected without any risk or inconvenience to the passengers. In hot and sultry weather, ice may be placed in the water receptacle of the receiving ventilators, whereby the air in the carriage is rendered cool and refreshing.

3. A Complete System of Day, Night, and Fog Signals.—This system of signals combines the highest degree of efficiency with great simplicity. For day signals, flags are employed, which are so arranged in shape and colour as to be distinct and distinguishable at any distance within the range of vision, whether extended by the breeze or drooping in calm. The flags consist of different combinations of only three colours, which present the most positive contrast with each other and the horizon, thereby enabling a great range of signal. The night signals are effected by the use of four lanterns arranged in a vertical line, each lantern being provided with a movable screen, or cylindrical envelope, to hide the light, and an inner ruby cylinder to colour it. These are at pleasure brought into requisition by means



This machine is the sole invention of Robert Davison, Member of the Institute of Civil Engineers, and known as the "Patent Thermantérion," or impeller of voluminous currents of heated air for either heating or drying purposes.

Its novelty is in its internal arrangements and construction, which consists of a double corrugated coil or spiral of cast-iron or other metal, heated by steam from a boiler, or by means of the exhaust steam from an ordinary high pressure engine; whilst a fan in the centre is made to impel cold air over the external surface of the said heated coil, and so generates a voluminous and rapid current of heated air at a temperature of 170 degrees Fahrenheit, or thereabouts.

A is the steam inlet;

B the condensed steam outlet; and

C the hot air outlet.

When there is no engine power at command to drive the fan a small disc impeller of the simplest construction is attached to its axis; which being set in motion by steam from an ordinary high pressure boiler, the required velocity is thus given to the fan; and afterwards the same steam, without the least loss, passes off to perform the double duty of heating the coil.

It is needless, and would be difficult, to enumerate all the purposes to which these machines are appli-

cable. It will suffice to state that they are peculiarly suitable for all large and public institutions, such as hospitals, lunatic asylums, barracks, factories, and other buildings, and also sea-going vessels, which require large quantities of pure and fresh heated air, rather than the sulphurous air and injurious draft engendered through hot metal stoves and naked fires.

For drying purposes the machines are, perhaps, even more important, as the very fact of a continuous current of heated air insures a rapidity and a purity in the drying which cannot be obtained by any quiescent or stagnant heat. Amongst the prominent purposes to which the system can be applied may be mentioned, yarns, malt, grain, paper, leather, wood, soap, starch, silk, and fabrics of almost every description.

The machines in the circular form shown, are made 3, 4, 5, and 6 feet diameter, and are capable of impelling from 500 to 2,500 cubic feet of air per minute; but there is scarcely any limit to the extent to which the system can be carried in a modified form of machine.

A most important feature in these machines is the fact that, taking quantity for quantity of heated air generated and impelled, that they compete most completely in point of cost, with hot water circulation, hot flues, or any of the other means in use for the purposes referred to.

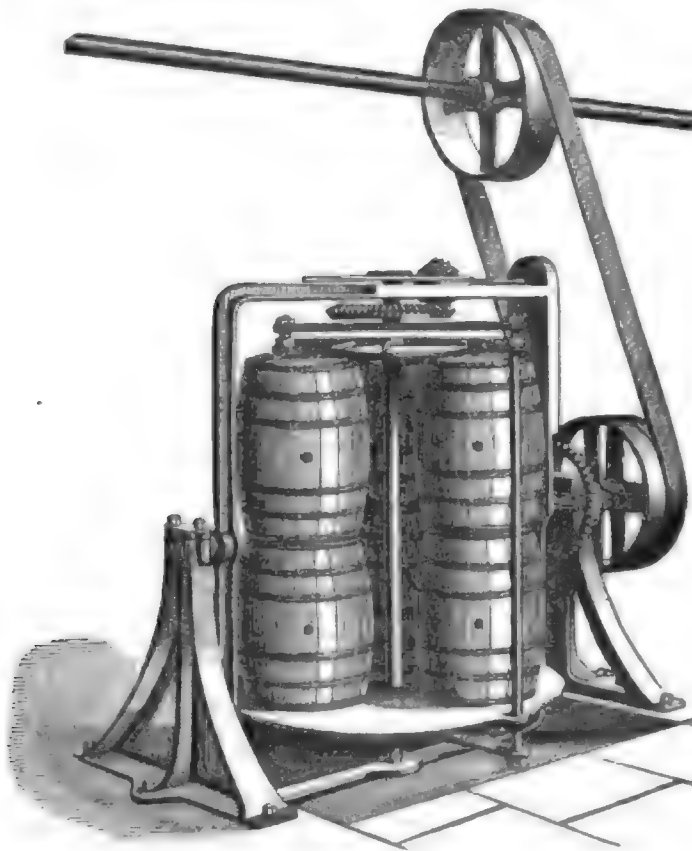


Fig. 2.—Davison and Scamell's patent cask-cleansing machine.

This invention differs from R. Davison's original machine, patented in 1843 (of which there are about 500 now working throughout England and Ireland), in the fact that these newer machines can be made to hold and cleanse any reasonable number of casks (no matter

the size) at one and the same time, whereas the older machines were more usually made to suit each particular size of cask, and so cleansing only one cask at a time. (See *Cut*, p. 105.)

These new machines are adjustable to suit either large or small casks—or casks in one or two tiers—as shown—by simply turning the inner frame to the right or left hand, which has the effect of either lessening or increasing the distance between the lower and upper discs. This will be the more easily understood when it is stated that the discs are fitted in the centre, one with a left-hand, and the other with a right-handed female screw, whilst the upright spindle or shaft on which they revolve is screwed at the two ends, right and left-handed to correspond. Thus the casks are either secured between the two discs, or *set free*, as the case may require, by simply turning the inner frame to the right or left hand, as before stated.

In practice, some prefer to cleanse the casks in single tier, say 5 barrels (36 gallon casks); these are thoroughly cleansed every fifteen minutes, so that from 200 to 250 of these casks can be easily cleansed by one of these machines in one day, at a cost for labour not exceeding one halfpenny per cask.

The cleansing medium is simply a small quantity of mixed round and sharp shingle, or the patent tassel chain, along with a gallon or two of hot water (Davison's patent, 1843), put into and released through the bung hole of each cask; and it ought to be mentioned, that one of the chief peculiarities of this machine is its singular compound *twirling* action, which causes the shingle or other cleansing medium to make a complete circuit over the inner surface of the cask in the course of only three revolutions of the machine.

It is almost needless to add that the object of these machines is to prevent the great expense of unheading; and in a sanitary point of view to avoid the sickening effect of cleansing maggoty and other foul casks by human labour; they also effect a considerable saving in space.

98 DOBSON & BARLOW, *Kay-st. Works, Bolton*; Manchester Office, 7, *St. Anne's place*.—Cotton-spinning machinery.

#### PATENT COTTON GINS.

No. 1. A DOUBLE CYLINDER SAW GIN, with thirty saws to each cylinder. The novel features in this machine are, that it is equal to two machines combined in one, and capable of doing double the work of ordinary single cylinder gins, whilst only occupying the same space, and only one main driving belt being needed. Another improvement consists in the application of a fan, with down draft; and two perforated zinc cylinders, and an elevated delivery creeper; by this arrangement the users of these machines are enabled to deliver the cotton in the same room without annoyance—thus preventing waste of cotton, and promoting the health of the workpeople, by keeping the room clear of noxious dust, and delivering the cotton in a cleaner condition by means of the fan and the perforated cylinders. It is also fire-proof.

The action of the machine is as follows:—One of the sets of saws is placed above the other, both projecting through a single polished grate; this grate is attached to a "hopper," into which the seed cotton is placed; and when a sufficient quantity of cotton is put in, it commences to rotate in the form of a roll, in the opposite direction to that of the saws, thus continuously presenting fresh surfaces of fibre to the needle points of the saws, which convey the cotton fibres through the grate, leaving the seeds behind.

A cylindrical brush is placed behind the saws, which revolves at a rapid rate; this brush clears the cotton fibre from the saw teeth, and delivers it on to the surfaces of the two perforated cylinders, whilst through the partial vacuum caused by the fan the dust and small leaf passes through both cylinders to the fan, which delivers it in any desired direction. The clean cotton then passes between the "cages" on to an elevated delivering creeper or lattice, and from thence falls off in the form of a fleece. When the seeds are completely stripped of their fibre, they pass through

a grating attached to the lowest part of the hopper into any suitable receptacle. This machine being constructed of iron, wherever practicable, is specially adapted for hot or variable climates.

No. 2. A FORTY-INCCH WIDE IMPROVED "MACARTHY" COTTON GIN, driven by power. The chief novelties in this machine are, that both the "doctor" and vibrating knives are made of cast-steel. The roller is capable of adjustment in a lateral, and the breast beam, together with the doctor knife, in a vertical direction. The crank shaft is of an increased strength, and its bearings strong in proportion, thus not needing any centre bearing, and avoiding unnecessary friction. The connecting rods are jointed to the vibrating knife, thus preventing the said knife from twisting whilst the machine is at work.

The mode of action of this machine is as follows:—The seed cotton is placed upon the feed table by the attendant, and spread evenly in front of the roller. The roller licks the cotton fibre in between its leathered surface and the doctor knife, whilst the vibrating knife is working up and down at the rate of 600 to 700 strokes per minute in front of the doctor knife; this vibrating knife turns over the seeds, which are partially enclosed by the fibre, until the leathered roller has taken off the whole of the cotton, which is delivered in a clean state on one side of the machine, whilst the seeds drop through a grating on the other side. During the working of the machine the attendant has to keep continuously presenting fresh surfaces of the fibre to the action of the roller and knives.

No. 3. A "KNIFE ROLLER GIN."—This gin is not thus named because it has merely a knife and a roller, but it is from the peculiarity of the shape and action of that part of the machine which turns over the seeds, whilst the cotton fibre is held between the leathered surface of a wooden roller and the steel surface of a doctor knife.

Description of the machine:—It consists of a wooden roller, 30 inches long; this roller is covered with sea-horse or other leather, and measures five inches diameter outside the leather when turned true. There is a steel doctor knife (as in the Macarthy gin) which is pressed against the leathered roller, and the cotton fibre is drawn in between them, as in the last named gin. In front of the doctor knife is another roller, from which this kind of gin derives its name, viz., a "knife roller;" it consists of a shaft, about two inches in diameter, upon which are threaded a number of thin discs of iron or steel; these discs are fixed on the shaft in a direction diagonal to its axis; and although the discs appear to be oval in shape, the periphery of the knives runs perfectly true; or, in other words, the knife roller would fit a true bored cylinder of the same diameter. These two rollers are geared together by suitable wheels, the relative speeds of which are about as 4 to 1. The object of the knife roller is to turn over the seeds in front of the doctor knife, first in one direction, and then in the other, both laterally and diagonally, until the whole of the fibre is taken off; and not only so, but it keeps presenting again and again fresh surfaces of the fibre to the action of the doctor and leathered roller, so long as it has any cotton to work. Under the knife roller is a wire grating, through which the cleaned seeds pass, when stripped of their fibre.

The principal points of novelty in this machine are—First, its simplicity as a roller gin—that is, one in which the cotton fibre is licked in between the surface of a leathered roller and a steel knife or doctor; it has no vibrating knife; no wood connecting rods, or joint for same; no radius rods or rocking shafts; no crank shaft or pedestals for same; all of which are to be found in the "Macarthy" Gin.

Secondly, it is the only effectual self-feeding roller gin hitherto produced.

Thirdly, the wearing parts are fewer in number, thus requiring less attention, and less oil to keep them in order.

Fourthly, the production is considerably greater, in proportion to the breadth of the roller, than on any other kind of roller gin; for instance, sixty 30-inch "Knife Roller Gins" will produce as much or more than one hundred 40-inch "Macarthy" Gins.

Fifthly, economy of room—say, for example, a 30 inch knife roller gin will occupy 3 superficial feet less room than a 40-inch "Macarthy."

Sixthly, economy of labour. Ten persons can attend to 60 knife roller gins, or 1 person to 6 gins.

Lastly, economy of power; as fewer gins will be required to produce the same, or, a better result, it is evident there will be a saving in the cost of the power employed; and not the least feature in this respect is, that the millgearing or shafting will do if run at a much slower speed than has hitherto been the case.

#### PATENT SELF-ACTING MULES.

No. 1 was spinning fine numbers out of Egyptian cotton: it contained 440 spindles  $1\frac{1}{4}$  in. distance. The yarn produced upon this machine was suitable for manufacturing into lace, cambric, or muslin. Double rovings and the after-stretch motion were used in this machine.

No. 2 MULE was spinning No. 32 twist, out of single roving made from waste and American cotton. The particular point of novelty in No. 1 mule is, the mode in which motion is given to the outward run of the carriage. This is accomplished by a train of wheels, which are termed a "differential motion," which we will now describe. On the front roller shaft is a bevel wheel, which runs loose upon it, and to this wheel is attached one half of a catch box; and upon the shaft is placed another half of the catch box, having a spur wheel attached to it. This last named half of the catch box rotates with the shaft, when it is geared with the other half, but is capable of being moved in a lateral direction, so as to gear and ungear. There is a disc between the two clutch boxes which is fast on the shaft; and it is by means of this disc that the connexion is made between the first driving wheel and the front roller shaft when the clutch boxes are put into contact.

The spur wheel last named drives an intermediate carrier, and this carrier drives a double carrier, the pinion of which drives a large spur wheel, which works loose upon the squaring or drawing out shaft; and to the last named spur wheel is attached a bevel wheel, which completes the arrangement of the quick driving side of the differential motion.

We will now describe the slow driving, or stretching side of the said differential motion:—

Upon the rim, or first shaft, is fixed a pinion, which works into an intermediate wheel; this wheel drives what is termed the "back change wheel," and it is by this change wheel that the speed of the drawing rollers and the speed of the drawing out of the carriage is regulated, without effecting any change in the relative speed of either the rollers or the carriage.

Upon the shaft which carries the back change wheel is fixed a four-threaded worm, which works into a worm wheel fixed on the top of a short vertical shaft, the lower end of which carries a bevel wheel, which drives a large bevel wheel working loose upon the squaring shaft. This last-named bevel wheel has a smaller one attached to it; this combination of worm and wheels forms the slow driving side, as before named.

We will now explain how these act upon the squaring or drawing out shaft, viz.:—

Upon the said shaft is fixed a socket stud, which carries a bevel wheel; this bevel wheel is in gear with each of the bevel wheels, mentioned as the last of the train of both the quick and the slow driving sides of the differential motion; but it is only in gear with both of them during the time the fluted rollers are running, or, rather say, that both the above-named bevels are driving the middle bevel on the squaring shaft when the rollers are delivering the thread; and when the rollers cease to revolve, the quick driving side ceases also; so that from this time to the completion of

the outward run of the carriage, the slow driving side alone completes the drawing out, but at a much slower rate than before; and it is during the time that the carriage is running at the slow speed that the yarn is stretched.

The next point of novelty is, the means adopted by which the various motions are put into and out of action, and at the precise moment when they are required. This is accomplished by a weighted lever or spring travelling with the carriage, which acts upon the bottom end of a vertical slide, the upper end of which carries a bowl or pulley; this pulley presses against the lower edge of a long lever which is jointed to the head-stock.

When the carriage has run out to its full extent, it releases a latch, and then the weighted lever forces the front end of the long lever upwards, the back end of which disengages the slow driving side of the differential motion, and stops the carriage. The remainder of the twist is then put into the yarn, and the twist shaft finger unlatches the strap fork, and a weighted lever connected to it changes the strap from the spinning pulley to the loose pulley. The movement of this strap lever permits a spring to put the backing off friction cones into contact; these first stop the spindles, and then reverse their motion, known as "backing off." When the spindles have turned back sufficiently, so as to unwind the coils of yarn from the point of the spindles to the nose of the cop, the long lever is unlatched a second time, and the front end makes a second rise, whilst the back end makes a second fall, and in so doing a bowl on the lever acts upon an incline, which is attached to the backing off cone fork, and disengages the cones, and stops the backing off. And at the same change of position of the long lever, a stud upon its end runs out the way of the incline on the end of the drawing up cone fork, and permits a spring to put the drawing up friction cones into contact. During the time the mules were backing off, the fallers were put down; and when the last named friction cones were put into contact, the carriage was drawn up to the roller beam, and the yarn wound on to the spindles. The copping motion travelled with the carriage, thus enabling this kind of machine to work satisfactorily on floors which may be rather weak, without affecting the shape of the cop.

During the time that the carriage is running towards the beam, the fluted rollers continue to deliver fibre to be spun, viz., about four inches at each stretch. When the carriage arrives at the beam, it comes in contact with a small finger, which releases the long lever latch a third time. When this is done, the carriage has brought the bowl which runs under the long lever to that end of it nearest the roller beam; and the moment the third latch is released, the weighted lever acts upon the long lever, which disengages the drawing-in motion, and restores all the other parts ready for spinning another stretch. Coarse numbers can be spun upon this machine as well as fine, as the stretching motion can either be put in or out of action at pleasure, without stopping the machine.

No. 2 MULE is especially adapted for coarse numbers, and is made without the differential motion, and has 420 spindles of  $1\frac{1}{2}$  inches distance; in other respects it was the same as No. 1.

In addition to the mules and gins, Dobson and Barlow exhibited photographs of their improved and patent machinery for every process connected with the manufacture of fibres.

97 DUGDALE, J. & SONS, *Soho Foundry, Blackburn.*—Power looms; hydraulic cloth press.—(See Mr. Sturgeon's Report.)

98 EASTON, AMOS, & SONS, *Southwark, London.*—Patent slate-dressing machines; slate-maker's "rest" implements. These machines are fitted up for cross-cutting slate blocks into lengths for splitting, and for splitting purposes. For the former, its action is similar to that of a stone sawyer's saw; and for splitting, it is that



will urge on the completion of the machine for Macnoffern quarry as fast as may be consistent with the best workmanship.

"I am, your obedient servant,  
"W. FOTHERGILL COOKE."

"Platt's Glass Works, near Stourbridge,  
"11th March, 1865.

"MR. GEORGE HUNTER,

"DEAR SIR—The Liverpool and Birkenhead Slate Company have worked your patent sawing machine at their quarries, Bracih Du, near Tan-y Bwlch, North Wales, for some time, and I have to state that the machine can cut slabs of any hardness up to 12 inches thick (the machine in use being only made up to cut that depth), at a speed equal to what the small-toothed circular saws cut two or three inches of soft slate, with the advantage over the small circular saw of making two or more slabs at the same time. The large machine with four saws will cut as many blocks in fifteen

minutes as will keep three slatemakers at work one day, provided these are large blocks. The power required is small, the machine with four saws not requiring more than from two to three horse-power to drive it, and the expense of sharpening the teeth or cutting tools very trifling, no files being required, and no renewing of saws. I can say positively that in cutting soft blocks your machines are really superior to the common circular saw, and in cutting hard blocks they have so great an advantage over sand saws that it would be almost absurd to make a comparison.

"I am, dear Sir, yours obediently,  
"W. B. ADAMSON, General Manager."

103 KAY, J. C. *Phenix Foundry, Bury, Lancashire.*—Horizontal condensing steam engine; patent safety valve; models of steam engines, and of patent unrestricted ball safety-valve; high-pressure engine.

104 KENNAN & SONS, 18 and 19 *Fishamble st. Dublin.*—Inventors and manufacturers.

LONDON 1861.



For Turnings with Kennan's Lathes.

DUBLIN 1865.



Prize Medal in Class IX.  
Awarded.

LONDON 1862.



Prize Medal, Class IX.  
Honourable Mention, Class VII.

For ingenuity, design, and excellent workmanship of lathes and tools. Everything exhibited by Kennan & Sons was made entirely at their own works, and in their ordinary style.

*Lathe No. 1, for Amateur Mechanics.*—With most complete apparatus for ornamental turning—traverse mandril for screw cutting; slide rest with adjusted stops to determine the motion of the slides; self-acting apparatus for driving the slide rest and mandril-head in either direction, and starting, stopping, or reversing instantly; curvilinear apparatus, for producing work of any described contour with the slide rest; spiral and wave line apparatus; geometric cutter with powers for spherical; single and double eccentric; epicycloid and prismoidal turning.

*Lathe No. 2, for amateur mechanics, with ornamental apparatus of simpler description than above.*

*Lathe No. 3.*—Strong plain lathe for amateurs' use.

*Lathe No. 4.*—Strong lathe for brass fitters and instrument makers.

*Lathe No. 5, for youths, exhibited as a specimen of sound plain work, at very low price.*

*Lathe No. 6, for engineers*—6-inch centre, 6-feet bed, strong slide-rest, and chucking apparatus.

*Circular Saw, for amateurs and cabinet makers, may be fitted in a lathe.*

*Drilling Machine, on upright standard, for instrument makers.*

*Vertical Drilling Machines, to 1 inch holes, for engineers' use.*

*Grinding Stone, on light angle iron frame, with adjustable holder to fix the tool at any desirable angle.*

*Pat Saw Machines (Kennan's Patent), about size of lady's work table, with treadle movement and wheel. There are but two moving parts, and any desired figures can be cut into wood up to 1 inch thick. The power required is so small that the machine may be worked for hours without fatigue; does not need any special instruction. These machines are made in different styles of finish and at various prices, from £5 10s.*

105 HACKWORTH, J. W. *Darlington Engine Works, Darlington.*—High pressure horizontal engine and models.

The bed plate and main carriage are in one casting, and made hollow, to get the greatest strength with the least material. The cylinder is fitted with "Hackworth's patent pass-over slide valve." The application of this valve to ordinary engines has been attended with a saving in fuel of from 25 to 30 per cent., by filling the side pipe and clearance space at the cylinder ends; the wear and tear is also considerably lessened by gradually restraining the momentum of the piston, &c., by the steam passed over. This valve is actuated by the "patent dynamic valve gear," controlled by the governor. The advantage of this gear over the ordinary "link" or other motion for variable expansion or reverse movement, are a better timed action, wider range of variation, and greater ease of manipulation; whilst, being perfectly under the control of the governor, the greatest amount of expansion compatible with the work done is obtained, rendering it in this respect equally advantageous for the ordinary factory engine, or the marine, locomotive, and winding engine, where reverse motion is required. Another important feature is the improved mode of heating the feed water, which is first brought into contact with the exhausted steam in an ordinary cistern, and heated to a temperature of 175°, and further augmented to 220° in a tubular heating apparatus, through which it is forced by the pump on its way to the boiler; the steam being disseminated over the tubular surface immediately on leaving the cylinder, and passes thence into the ordinary cistern.

The advantage of a high temperature of the feed water is not only of the first importance as an economizer of fuel, but as a purifier of the water, and a preventative of the unequal expansion and contraction so detrimental to boilers.

The joints are made with "solid pins;" and the surfaces are double the usual size, thereby securing the minimum of weight and friction, and the maximum of strength and durability. Its compactness and simplicity render it admirably adapted for exportation.









capacity of every workman, and will insure the return of its cost in a short period of time.

The price of the whole, £95, nett cash. Boring apparatus fixed in addition, £7 10s. extra.

The above machine, as an ordinary saw table, is warranted to equal any before the trade, for *sawing* up to 12 inches deep; it can be altered in a few minutes from a *sawing* to a *planing machine*, and will plane up the surface of 11-inch stuff of any thickness, from  $\frac{1}{4}$ -inch to 11×11 inch, at the rate of 60 feet per minute; it is also a first-class *moulding machine*, and will strike mouldings 5 inches wide, on wood of any width and thickness, at the rate of 10 feet per minute. It is also adapted for *cutting tenons* in a first-class manner, as fast as a man can pick them up, running two saws at one time. The *drunken saw* is invaluable; for by once passing over the saw, grooves can be made from  $\frac{1}{4}$  to  $2\frac{1}{4}$  inches wide by 3 inches deep. The rate of this work is regulated by the depth and width of the groove required, and which the person using the machine must regulate. Ordinary grooves for doors, &c., say  $\frac{1}{2}$  by  $\frac{1}{4}$ -inch, can be turned out in a first class manner by this machine at the rate of 16 feet per minute. As a *boring machine* it is also invaluable to most workers in wood, boring holes of any size up to  $2\frac{1}{4}$  inches, and any depth up to 13 inches, in a first class manner in half a minute.

861 PENN, J. & SONS, *Greenwich*.—Model of a pair of patent trunk marine engines of 360 horse-power, as fitted to H.M. ships "Arrogant" and "Encounter;" specimens of machine work; connecting rod, link, &c.

862 STURGEON, JOHN, *Burley, near Leeds*.—Working model of Carrett, Warrington, and Sturgeon's patent self-acting coal-cutting machine.

This machine, being only recently completed, was placed in the Exhibition subsequent to the visit of the Jurors, and was, therefore, not included in their Report.

This machine is intended to perform the operation of *holing* or *under-cutting*—an operation attended with great risk to human life under the old system of hand labour. Many attempts have been made to substitute machinery for hand labour in this, the most severe and dangerous part of the collier's work. These attempts have, however, for the most part proved failures, as the

machines hitherto introduced have been arranged to be worked or guided entirely by the hand of an attendant, who had a particular operation to perform for every stroke of the cutter, and every step of the machine as it progressed. This necessarily rendered the successful working of the machine a matter dependent upon the skill, dexterity, and good will of the workman, who, if prejudiced against the use of the machine, has it in his power to render it non-effective in its working, and thereby insure its rejection. There were, besides, several other serious objections—as, for instance, the great amount of labour required in advancing the machine up an incline, at the same time that the other operation for cutting and releasing the cutter had to be performed with unremitting accuracy and precision; and, lastly, there was the insurmountable objection that these machines, having to be worked along, and followed by the man in attendance, were entirely unadapted for use in very thin coal seams, where (the yield being less in proportion to the labour bestowed and the waste in the under-cutting) the advantage of machine cutting would have been of most importance. To obviate this disadvantage, several attempts were made to render the machine *self-acting* in all its movements; but as the action of all these self-acting movements was based upon the supposed regularity in the length of stroke, which in reality is constantly varying by the cutter coming in contact with pyrites and hard substances in the coal; and as the cutter was, moreover, liable to fasten or wedge itself tight into the coal, the self-acting machines were continually getting into trouble and coming to a stand still every two or three strokes; it was therefore considered expedient to abandon the attempt. The coal-cutting machinery, being thus only imperfectly developed, was left in a practically useless state.

The improved arrangements introduced by Messrs. Carrett, Warrington, and Sturgeon, are the result of a careful study of the question, and a long and elaborate course of experiments, which have led to the development of a machine perfectly self-acting and self-adapting, independent of all attendance, and workable in the thinnest coal seams in the kingdom.

The engravings which follow will give a clearer view of the advantages of the new system.



Fig. 1.—Old system of Holing or Under-cutting, showing Position of Miner at Work.

Fig. 1 is an illustration of the old method by hand labour. The falling down of the bank or wall of coal, at which the man is working is one of the most common causes of accidents in coal pits. On this system the man will under-cut a length of  $7\frac{1}{4}$  yards, one yard back into

the coal, for one day's work; but will in doing so cut away into mere slack a quantity of good coals, to the extent of 12 or 14 inches at the face of the coal, and narrowing inwards:—

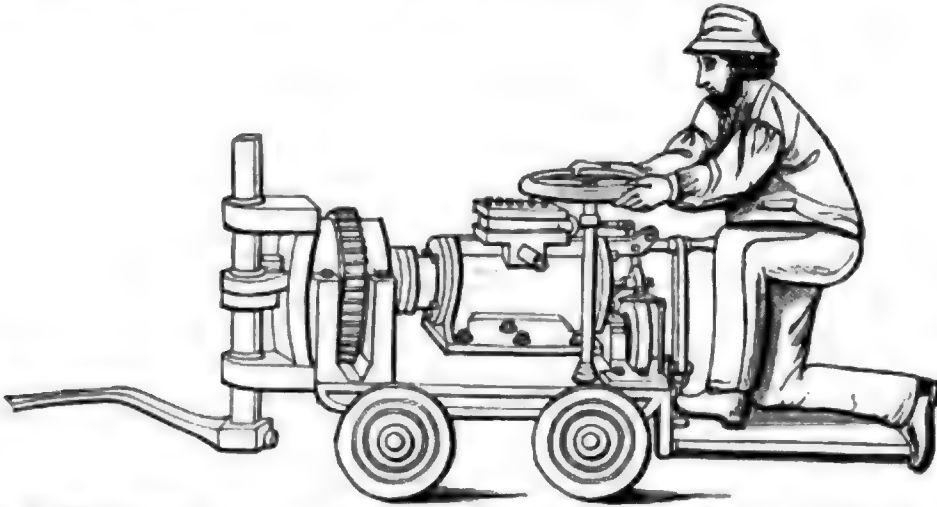


Fig. 2.—New System of Holing, or Under-cutting, by Compressed Air Engine, worked by hand.

Fig. 2 is an illustration showing the new system with the most improved machine, as now in use in some collieries, the machine being worked by the attendant. With this machine, when working in coal of a medium degree of hardness, a length of 15 yards can be under-cut in one hour, in three courses over, giving a final

depth of one yard, with the width of groove in front of about  $2\frac{1}{4}$  to 3 inches. This machine, allowing sufficient head room for working, would not enter a seam of less than 2ft. 6 inches to 3 ft. in height, and is subject to all the defects mentioned above. The motive power is compressed air.

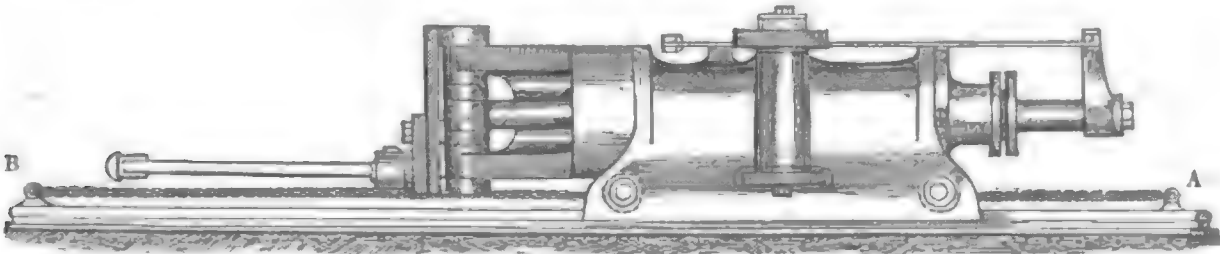


Fig. 3.—Carrett, Warrington, and Sturgeon's Improved System. Self-acting, and adapted for Smallest Cuttings.

This machine, when once started at A, will work itself along the chain to B, by means of its own self-acting mechanism, without any interruption, the length of the chain, and, consequently, the travel of the machine, being determined by the length of the face of coal required to be holed or under-cut. It will cut, in hard coal, at the rate of 40 yards an hour, finishing the work to its full depth (1 yard) as it advances, and completing it in a single course. The machine will remain stationary while cutting until the full depth is attained; it will then commence of its own accord to draw itself forward along the chain, stopping whenever the cutter meets with obstructions, to repeat its strokes, or blows, until the cutter has penetrated to its required depth. The valve motion is arranged on a similar principle to that of Sturgeon's patent steam hammer—to take effect in either a long or a short stroke. A compound motion is applied, by means of an eccentric (Fig. 4), to the pick or cutter, which imparts to it a sudden movement when buried in the coal, the effect of which is to loosen the cutter (which is sometimes liable to get wedged fast in the coal), to facilitate its withdrawal by the action of the engine. The machine is greatly simplified by dispensing with the truck or carriage shown in Fig. 2. This is effected by mounting the bearings of the axis

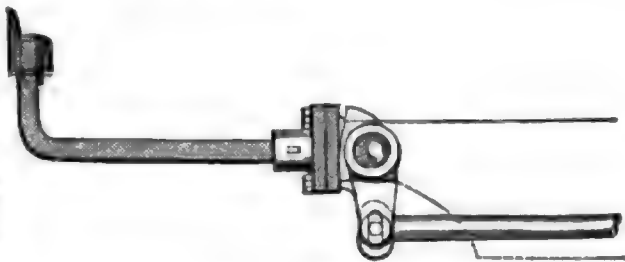


Fig. 4.

directly on the cylinder itself, which thus, in a manner, becomes the carriage. The self-acting gear is exceedingly simple, and will work until completely worn out without danger of getting out of order.

The foregoing illustrations will give the reader a comparative view of the advantages of each system over the preceding one. A more detailed description of Carrett, Warrington, and Sturgeon's improved machinery will be found given in the following extract from the specification:—

"This invention has for its object 'improvements in machinery for cutting coal, stone, or other minerals,' and relates—

"Firstly, to a new and improved mode of actuating picks or cutters used for the above purpose. Heretofore it has been usual, when actuating picks by compressed air engines to impart to the pick a simple vibratory motion on a fixed centre attached to a carriage, simultaneous with and by the piston of the air engine; and in order to release the pick from the coal or other substance, to facilitate its withdrawal after each successive stroke, it has been usual to impart a backward movement to the carriage on which the pick is mounted, by manual power.

"Now, the first part of our invention consists in imparting to a pick or picks, or cutters, by the piston of an engine, worked by compressed air, steam, gas, or other elastic fluid, a compound vibratory action, embodying a twofold movement with every vibration of the pick or cutter: thus including in and accomplishing by the one movement of the piston that double movement of the pick or cutter necessary to its efficient and uninterrupted action, which has heretofore been produced partly by the piston of the engine, and partly by hand.

"One of the modes of effecting the above-named improved action of the picks or cutters, is to attach the pick or cutter to an axis which is capable of being shifted on its centre of vibration independently of the lever arm or other appliance, through which it receives its motion from the piston; the piston being allowed to move a short distance at each end of its path while shifting the centre of vibration, without simultaneously acting on the pick or cutter. This may be effected in a variety of ways, but an arrangement of parts which will serve the purpose may be described as follows, that is to say—The piston rod of the engine gives motion to a lever arm having a boss on both sides of sufficient length to be carried in suitable bearings. This boss is bored out eccentrically to receive a spindle, to which the pick is conveniently connected. The boss of the lever arm is provided with clutch teeth, fitting into corresponding clutch teeth on the spindle, but leaving a determinate amount of side play or clearance between the teeth. The spindle carrying the pick or cutter is partially rotated by reason of the clutch teeth on the boss of the lever arm acting against the clutch teeth on the spindle until the stroke is completed. At the commencement of the return stroke the boss of the lever arm is, by the action of the piston, turned in the reverse direction through a certain determinate space, before the clutch teeth come in contact at their opposite sides to carry the pick backwards; and during this movement the eccentricity of the boss with regard to the spindle shifts the axis of the pick, thus imparting to the pick the compound action described, whereby the pick is drawn nearer to the machine, thus assisting its release from the coal or other substance after each successive stroke. (See Fig. 4, page 211.)

"Another way of effecting this object, and dispensing with the eccentric action of the axis, is to impart a simple vibratory motion to the fulcrum end of the pick shaft or stem, simultaneously with the piston through the means of a lever arm, segmental rack, or other suitable contrivance; whilst the remaining portion of the pick shaft and the pick head thereto attached partakes of a compound motion. At a convenient distance from the end of the pick shaft or stem we apply a joint, operated on by a spring or springs moving therewith. The tendency of such spring or springs is to keep the pick shaft rigid and straight; but when the pick has completed its stroke, and penetrated the coal or other substance, the momentum (assisted or not by the pressure of the piston) of the pick shaft and its appliances vibrating therewith, causes it to bend or unstraighten itself, so as to cause the pick head to deviate, for the instant, from its ordinary curvilinear path, and thereby loosen it in or from the coal or other substance, and thus facilitate its withdrawal for the return stroke.

"The same object may otherwise be attained by making the pick shaft of some suitable elastic material. But in all cases the pick head receives a compound motion derived from the simple movement of the piston,

the effect of which is to release it more easily, and thereby to form a distinct improvement on the usual rigid pick shaft, having a simple vibratory motion from the piston, necessitating a backward movement being applied to the carriage by hand.

"Secondly, our invention consists in a new and improved combination of the several working parts, whereby the use of a separate 'under-carriage or truck,' to carry the cylinder together with the picks or cutters, is entirely dispensed with, thereby producing a machine of a much smaller and more convenient size than is practicable where picks are actuated by means of a compressed air engine mounted on and carried by the same carriage as the picks, as has heretofore been the case. For this purpose we propose to mount the bearings carrying the pick axis so as to be attached to and in connexion with the working cylinder itself, which cylinder may then be conveniently arranged to run upon skids or wheels, or upon skids and wheels combined, attached directly thereto without the intervention of a separate 'under-carriage or truck.' These bearings may be either attached in a permanent position on any convenient part of the entire working cylinder, the cylinder having attached thereto skids or wheels; or they may be so attached as to be readily shifted and adjusted so as to enable the pick to be worked at different angles, and in different directions. This may be accomplished in a variety of ways, some of which we will now proceed to refer to:—

"First, the axis bearings may be secured on the cylinder, or on the cylinder cover, so as to be conveniently adjustable relatively thereto.

"Second, the axis bearings and cylinder cover (through the centre of which the power is transmitted to the lever arm) may be made so as to be together relatively adjustable to the remaining part of the cylinder.

"Third, the complete cylinder, together with the axis bearings, may be arranged so as to be capable of being suitably adjustable relatively to the skids or wheels on which the whole rests; for example, by attaching the skids or axles of the wheels to a hoop or hoops, within which the entire cylinder together with its axis bearings is capable of being turned as required.

"Fourth, the axis bearings may be carried by an adjustable hoop or bracket, passing round and embracing a part or continuation of the cylinder or boss on the cylinder cover, which cylinder is provided with wheels or skids.

"Fifth, the axis bearings and cylinder can be adjusted relatively to the cylinder covers, which latter carry the whole, and are provided with skids or wheels.

"Sixth, the axis bearings, and the part of the cylinder against which the piston rubs, can be adjusted relatively to the remaining portion of such cylinder, which contains the ports and valve, and is provided with skids or wheels; and, conversely, the axis bearings and outer part of such cylinder, and its ports and valve, may be adjusted upon the interior portion or internal cylinder against which the piston rubs, the latter being provided with skids or wheels.

"We may here observe, that we are aware that it has been before proposed to vary the angle of the pick axis, a mode of doing which is shown in the specification of a patent dated the 27th day of October, 1863, number 2,659; of which patent the herein named John Sturgeon is part proprietor. We do not, therefore, claim the modes here described as for the purpose only of varying the angle or position of the pick axis; but what we claim as new and improved in respect of this part of our invention is, the mode or modes herein described of so mounting and carrying the pick axis along with the working cylinder itself, that the use of a separate carriage is thereby dispensed with.

"Our invention consists, *thirdly*, in an improved mode of connecting the pick, or cutter, to the axis, whereby the pick is enabled to be adjusted so as to work in any required position along the line of the axis, without interfering with, or being interrupted by, the

bearings of such axis—such picks or cutters having heretofore been capable of only a limited amount of variation, interrupted by the bearings of such axis and the boss of the lever arm. This may be effected by providing a plate, or bar, or other suitable contrivance, connected to the axis, but in such a manner as to work outside, unobstructed by and clear of the bearings carrying the axis, along with which the said plate or bar vibrates. This plate or bar may thus be extended to any required length beyond the bearings in either direction; and the pick, being capable of being suitably attached to any part along the same, may thus be set so as to work at any point within the length of such plate or bar.

"We also propose to make the cutting part of the pick of a curved or gouge-shaped form; or one or more cutters of this improved form, or of the ordinary form, may be attached separately to the pick head, so as to be easily removed for repair, and replaced.

"In order that the machine shall be effectually held down upon the rails or trams on which it runs during its operation, we propose to apply a bar or guide of convenient length and suitable form, facility being provided at each end thereof for securing the same between the roof and floor, or roof and rails, and along which bar the machine slides, and is thereby held down; and upon which also it may traverse itself until it can proceed no further, when the bar will require to be released, moved forwards, and again secured, to allow of the further progress of the machine.

"In place of the bar above named, one or both of the rails may be made to serve the purpose of holding down the machine; to effect which, the machine (besides resting on the rails by its gravity) is provided with suitable projections, partly embracing and sliding under the head of the rail or rails—such rails being also secured or held down for the time being by means of portable holdfasts pressing against the roof, which holdfasts may be from time to time released, advanced forwards, and refixed, to allow the further progress of the machine.

"The slide, or other valve or valves, of the hereinbefore described machines may be worked by self-acting mechanism, so as to suit a variable length of stroke, by means of a momentum wheel, or moving weight receiving motion from the piston rod of the engine, in such a manner that when the movement of the piston has ceased, the continued movement of the wheel or weight caused by its momentum actuates the valve—certain modes of effecting which have been described in the specification of a patent granted to the herein named John Sturgeon, dated 24th September, 1863, number 2,357. These machines may also be propelled along the rails by means of a self-acting mechanism—as also described in the specification of the said patent—and so arranged that the pick must first penetrate to a certain determinate depth into the coal, or other substance, before the machine can advance."

**863 TATHAM, JOHN, Rochdale.**—Machinery for the manufacture of cloth.

This machinery, the most complete, perfect, and improved of its kind, comprises all the machines employed in the manufacture of cloth, from the first or carding process to the last, viz., the weaving into cloth. It consists of three preparatory or carding engines; one self-acting mule, and one loom; all of which, besides being constructed in a superior style as regards workmanship, contain important improvements, the whole forming, in fact, a complete revision of the old system of cloth machinery.

In the first, or carding process, three machines are employed, viz. :—

- One Scribbler;
- One Intermediate;
- One Finisher;

the joint action of which produces a light, even, homogeneous roll or thread of wool.

For want of a superior class of machines, manufac-

turers have heretofore experienced great difficulty in effecting this in a perfect and economical manner, and until recently but few have been able to accomplish it.

The carding engines constructed after the old and cumbersome style, with wood cylinders, and in a rough and inferior style of workmanship, have always proved a constant source of trouble and annoyance, and were continually becoming deranged. Cylinders, doffers, breasts, and other of the carding parts, when constructed of wood, are always liable to get out of truth through the variations in temperature, notwithstanding all the care that may be taken with them; and the only remedy in such cases is to strip them of their cards, and turn them up afresh—a process which is costly in loss of time and work, and is, besides, injurious and destructive to the cards.

As it is of the highest importance to have the doffers, workers, strippers, &c., nicely adjusted, and set to revolve as close to the cylinder as possible (without touching), it requires the whole to be made and kept firm and perfectly true. Failing this, an inferior quality of yarn is unavoidable; for no skill or attention paid to any subsequent department of the process can altogether remedy the imperfection and inequalities produced. Hence it is to obviate and remedy these evils and defects that the present improved carding machines have been made.

The best methods of construction are introduced for giving strength, durability, truth, and increased facilities for adjustment; the cylinders, doffers, breasts, strippers, takers-in, &c., are constructed of iron, light, strong, and well-balanced, and revolve with the greatest accuracy and truth, with every facility for fixing and firmly securing the cards thereon. They are of superior construction, the parts usually made of wood being now constructed of iron, are not required to run from one to two months, as is usual with the old machines, in order to season the timber before passing the wool through them, but can be got to work without any delay, at an increase in speed and production, and a superior class of work.

The Patent Self acting Mule, with 190 spindles, 2½ in. distance, with brass plate bolsters, and steps, and surface drums, to spin from condensor bobbins, contains all the latest improvements introduced by Mr. Tatham, and best methods of construction and workmanship, with every necessary motion for either alubbing, roving, spinning, or doubling all descriptions or mixtures of fine or coarse wool for weft or warp, on to either bobbins, tubes, or the naked spindles, which makes these mules complete as self-actors.

The novelties embodied in the Machine are :—

1st. In a twist motion, for regulating the required amount of twist to the yarn without the necessity of changing wheels, as is usual.

2nd. In an arrangement of a sliding bar for stopping the winding drum from winding on the quadrant chain during the last few inches of the outward run of the carriage, and thus regulating the time for putting the winding click or catch in gear, after the jacking motion ceases.

3rd. In a new method of drawing in the carriage to any required extent, during the operation of the twist motion, by the same band which draws out the carriage, without the use of change wheels, cams, &c., as is usual.

4th. In a new self-regulating motion for putting the tacking motion out of gear at the required moment, without the necessity of the attendant resetting the holding-out catch stud and levers, or changing a wheel, so frequently required in ordinary self-actors.

5th. In a simple arrangement for readily regulating and giving out from the delivery rollers to the spindles any required length of alubbing and roving to be spun, &c., without the use of change wheels.

6th. In a new motion for varying the speed of the drawing-out scroll and carriage during one and the same draw, for spinning certain long wools, for want of

which all other self-actors hitherto made have failed to spin effectually.

7th. In mechanism for causing the rollers to deliver out a little slubbing just as the carriage is completing its inward run up to the roller beam, and by this means causing a little of the softly twisted material to be coiled around the spindle point, to improve the quality of the spinning and yarn.

8th. In an arrangement of mechanism used in certain classes of work for reversing the motion of the delivery rollers immediately after they have ceased to deliver the required length of slubbing or roll of carding, thereby causing a small amount of the partially spun yarn to return behind the rollers, to protect it from being unnecessarily stretched, weakened, or beaten by the next draw out of the carriage.

9th. In a new self-acting motion for governing the winding speed of the spindles, as the cop of yarn increases in diameter, so as to wind a firm and hard cop without breaking the threads.

10th. In the use of two drawing-up scrolls, one on each side of the head stock, by which means the carriage is drawn up more steadily and truly parallel, to the delivery rollers, by means of a much smaller band than usual and those for driving the tin rollers and spindles, which, when broken, can by this arrangement be used up, instead of being cast aside, as is usual; or should one of the bands break, the remaining one will drive the mule until the next stopping time, when it can be repaired without the loss of time or work.

11th. In the use of mechanism for enabling the attendant to readily stop the running in of the carriage, in case of damage or accident, and to obtain, when required, a shorter draw.

All the above named motions are simple and effective, easy of adjustment, and calculated to spin any class or description of yarns in a superior and economical manner.

They are now being almost universally adopted in all the principal woollen manufacturing districts in Great Britain, Europe, and America.

In the 100-inch woollen loom exhibited by Mr. John Tatham, the following novelties and improvements are embodied—

1st. The slay, or lathe, is worked by a cam so shaped that the reed is held quite still while the shuttle is passing from one shuttle-box to the other.

2nd. The shed is formed by a series of hooks, which are lifted and depressed by lifters worked by a cam so shaped, that during the whole time the shuttle is passing, the yarn is perfectly still and full open, leaving ample room for shuttle to pass. This cam also works a vibrating rest over which the yarn passes, which, being worked by the same cam, must necessarily be doing its work at the right time, thus giving and taking the yarn, when required, for making and closing the shed.

3rd. The picking motion is easily changeable, to throw any number (odd or even) picks from each shuttle. The rising box motion is worked by a chain having elevators of different heights, each link representing a change of shuttle; and a second chain, representing in each link a throw of the shuttle. The boxes can be worked so as to throw five shuttles in regular succession.

This loom is well adapted for weaving reversible cloths, and adaptable, by the aid of Jacquard apparatus, to weave Scotch, Kidderminster, Dutch, &c., carpets.

4th. The letting off the yarn is done by simple pan weight friction.

5th. The taking up of the cloth is positive; so that any required number of picks of weft can be put in. This motion has only one beam, which is adapted for weaving wet weft: the cloth is taken up, as it is woven, by an emery roller, and allowed to fall on the floor to prevent mildew.

Card clothing exhibited on these machines by Messrs. S. Law and Sons.

864 LAW, S. & SONS, Cleckheaton, Yorkshire.—Manufacturers of cards for all kinds of fibrous materials.

865 RYAN, W. Fishamble st. Dublin.—Martin's patent wood turning lathe.—(See Mr. Sturgeon's Report.)

866 SIEMENS, BROTHERS, 3, Great George st. London, S. W.—Electrical signal between engine and boiler room.

867 GRENDON, T. Drogheda.—Locomotive engines.—(Agricultural Hall.)

868 MITCHELL, J. J. Portmahon House, Dublin.—Portable flax-scutching machine.—(Agricultural Hall, Kildare st.)

869 POWIS, C. & Co. Cyclops Works, Millwall Pier, London, E.—Wood-working machinery, comprising band saw, circular saw, universal joiner, mortising machines.

870 EDMUNDSON & Co. Capel st. Dublin.—Patent portable gas apparatus; Lenoir's gas engine, "a new motive power;" Anderson's patent gas exhauster and engine combined; patent concentric governor.

This is an elegantly-manufactured engine, having gas for a motive power, and a galvanic battery for a boiler. The Lenoir engine is in appearance very much like a horizontal steam engine, having a cylinder, piston, crank, shaft, and fly-wheel; the cylinder has the necessary slide arrangements for the admission of coal gas and atmospheric air in due proportions, which at the proper moment is ignited by the electric spark—the connexion being made and detached by the rotary action of the crank shaft—the expansive force, consequent on the ignition, gives motion to the piston on each side alternately. The cylinder has a water jacket surrounding it, through which a stream of water is kept gradually flowing to absorb any excess of heat. Its consumption of gas is as near as may be 70 feet per horse power per hour of actual work, giving a cost, with gas at 4s. per 1,000 feet, and including expense of battery, not exceeding 4d. per hour; it may therefore be fairly assumed, that wherever gas is to be obtained, and in proportion to the lowness of its cost, there will be a large demand for a power at once so easy, safe, and economical, so multifarious are its capacities of application. The gas engine is elegant in appearance; in construction simple; there is no boiler, generator, or accumulation of power, so that explosion is impossible; it is very clean, and free from heat, smoke, dust, dirt, or noise; its power is either constant or intermittent, and the cost only co-existent with its working. It is not liable to derangement, and in wear and tear the cost is reduced to a minimum sum; there being no boiler, there is no chimney, and consequently no fear of giving annoyance to neighbours. The current of water passing round the cylinder, being heated, will give a constant supply of hot water where desired. No skilled engineer is required; the engine can be instantly started, and as quickly stopped; once set in motion (which may be done by any one after a little instruction) it may be left without danger, as should it stop from any cause, no injury can ensue, while no fear need be entertained of its exceeding its speed. It can be worked in any apartment, on any floor, and under circumstances where steam power would be totally inadmissible, and, in fact, possesses all the elements to render it a most popular motive power. In Paris this engine is doing hotel and other work—moving hydraulic lifts, making ices, and cleaning boots! Messrs. Edmundson likewise exhibit Wigham's patent portable gas apparatus, which comprises, in fact, an entire set of portable gas works, rendering easy the lighting of country houses by home-made gas. The advantages of this apparatus are its simplicity—an ordinary labourer can attend to it without having his time for other occupations interfered with—the perfect purity of the gas produced, and the economy and brilliancy of its light. In addition, in this department they show several inventions of Mr. Anderson, the eminent gas engineer, the most important of which is his "gas exhauster." The advantages arising from the use of this instrument are stated by the inventor to be—an "additional yield of 10 to 15 per cent. in the quantity of gas extracted from the coal; a similar or greater addition to the duration of the retorts, on account of the pressure being removed, less

incrustation of carbon on the interior of the retorts, and a saving of fuel in consequence, as well as increased illuminating power, from the carbon being combined with the gas; facility to use earthen retorts, which are only half the cost of iron ones, and last double the time, and which, without an exhauster, are apt to leak the gas through their pores; greater ease to the men in putting on, and luting up the lids of the retorts from the absence of flare in their faces, and less loss from faulty joints in the whole of the pipes in the retort house, facility also to use washers and scrubbers, necessary to render the gas pure enough for domestic use, and which cannot be profitably worked without an exhauster, on account of the pressure they throw back upon the retorts.

**871 POWIS, C. & Co. Cyclops Works, Millwall pier, and 51 Gracechurch st. London, E.**—Mortising, planing, boring, and tenoning machines; band sawing machine; joiner's saw bench—(see Mr. Sturgeon's Report)

**872 HUGHES & KIMBER, West Harding st. Fetterlane, London.**—Printing and paper cutting machine, for steam power; newspaper addressing machines, worked by Forster & Co., Crow-street, Dublin, and by the Proprietors of the *Dublin Medical Press*.

**873 GREENMOUNT SPINNING CO. Dublin.**—Two power-looms.

**NOTE.**—Considerable difficulty was experienced in obtaining an adequate display of Machinery, especially of that in motion, for although circulars were sent to the different exhibitors in this department at all former exhibitions, and the co-operation of the Society of Mechanical Engineers was invited, but few machinists were found to be registered as intending exhibitors when the time came for the allotment of space. The Executive Committee therefore determined to take vigorous action in the matter, and directed the Secretary to visit the leading machinists in Lancashire and Yorkshire, and obtain, if possible, at least one or two exhibitors in each branch of machinery. This mode of proceeding was so far successful that the machines used in the manufacture of textile fabrics were represented in a most creditable manner by some very eminent firms, and formed an attractive feature. The absence of certain manufacturing machines and tools may be attributed to the fact that many machinists who promised to exhibit failed to come forward at the last moment, which they regretted afterwards when too late, while visiting the Exhibition during the meeting of the Mechanical Engineers held in Dublin that year; also that several were of opinion they would not find a market in Ireland for the particular machines they made. Further, the activity that prevailed in the market at the time prevented some firms from exhibiting, who, though willing, were unable to do so from the numerous orders they had to attend to. The following instance of this is worthy of note:—The Messrs. Fairbairn, of Leeds, the eminent flax machinists, refused to exhibit, stating that their hands were so full of work that they had to keep their factory going both day and night to meet their engagements, though the great part were for Irish orders.

#### NAMES OF JURORS.

**JULIUS DIEFENBACH**, Ass. Director of the R. Chamber of Commerce, Stuttgart.

**R. MALLET, F.R.S.**, Civil Engineer.

**A. MACDONNELL**, Locomotive Engineer, G. S. & W. R.

**ALFRED TYLOR, F.G.S.**, Brassfounder.

#### LIST OF AWARDS.

##### MEDAL.

##### UNITED KINGDOM.

**72 LEBLANC, D. F.** 102 Fleet st. London, E.C.—For his dioptical water-gauge tubes for steam boilers.

**73 MERRYWEATHER & SONS, Longacre, and Lambeth London.**—For their steam fire engines, and for progress and excellence of workmanship.

**76 RUSSELL, J. & SONS, Wednesbury.**—For their wrought-iron tubes, &c

**78 GREIG, D. & J. Fountain House Works, Edinburgh.**—For good collection of machines for paper cutting, printing &c.

**80 SPENCER, J. & SONS, Newcastle.**—For their railway springs, buffers, &c.

**81 BOOKER, T. W. & Co. Melin Griffith Works, near Cardiff.**—For excellent quality of iron.

**83 TURNER W. Hammermith Iron Works, Dublin.**—For original designs of great merit.

**87 SHAND, MASON, & Co. 75 Upper Ground st. Blackfriars' road, London, S.**—For their steam fire engines, and for progress and excellence of workmanship.

**88 SHARP, STEWART, & Co. (LIMITED), Atlas Works, Manchester.**—For their machine tools, and for ingenuity and excellence of workmanship.

**89 PHOENIX PATENT BOLT & NUT CO. Glover st. Birmingham.**—For good workmanship.

**93 WHITFIELD, T. & Co. Freeth st. Birmingham.**—For atmospheric hammer.

**95 DAVISON & SCAMELL, 1 London st. London, E. C.**—For great ingenuity and progress in desiccating machinery, and for cask cleaning apparatus.

**96 DOBSON & BARLOW, Bolton, Lancashire.**—For excellence of spinning mules; for design and manufacture; and for cotton gins.

**97 DUGDALE, J. & SONS, Soho Foundry, Blackburn.**—For excellence of power looms.

**98 EASTON, AMOS, & SONS, Southwark, London, S.**—For excellence of slate-dressing machine.

**99 FARMER & BROUGHTON, Adelphi st. Salford, Manchester.**—For excellent flax machines.

**100 FRIEDLAENDER, J. Knockoloughrim, near Castle-dawson, co. Derry.**—For a most useful flax-scutching machine.

**101 CHAPELIZOD FLAX SPINNING MILLS (R. HOEY & SONS), Dublin.**—For a very good collection of flax machinery at work.

**102 HUNTER, G. Maentwrog, Merionethshire, North Wales.**—For ingenuity and progress in slate-cutting machinery.

**103 KAY, J. C. Phoenix Foundry, Bury, Lancashire.**—For excellent design and execution of steam engines.

**104 KENNAN & SONS, 18 and 19 Fishamble st. Dublin.**—For ingenuity, design, and excellent workmanship of lathes and tools of different kinds in Section V (B.); also for a collection of farming implements in Section IX.

**105 HACKWORTH, J. W. Darlington Engine Works, Darlington.**—For ingenuity and design of a remarkably elaborate steam engine.

**107 MURRAY, B. A. 15 Peter st. Dublin.**—For silk machinery.

**112 ROBINSON, W. Wemdon, Bridgewater.**—For cask-cleaning machinery.

**113 ROWAN, T. & SONS, York st. Foundry, Belfast.**—For excellent flax machinery.

**115 STURGEON, J. Burley, near Leeds.**—For his steam hammer, and for progress.

**116 SOUTHALL & HEAP, Market st. Staleybridge.**—For progress in shoemaking-machinery.

**118 NOBLE & COLLIER, Park Mills, Halifax.**—For excellent wood-cutting and sawing machines, and for good design and workmanship.

**150 MUIR, W. & Co. Britannia Works, Strangeways, Manchester.**—For their excellent collection of machine tools, lathes, &c.

**189 SCHAFFER & BUDENBERG, 96 George st. Manchester.**—For water meter and pressure gauges.

**180 OWENS' PATENT WHEEL, TIRE, & AXLE, CO. (LIMITED), Phoenix Iron Works, Rotherham, Yorkshire.**—For excellence and progress.

**181 COURTNEY, STEPHENS, & Co. Blackhall place, Dublin.**—For ingenuity, progress, and for a great variety of excellent machines and apparatus.

**865 RYAN, W. Fishamble st. Dublin.**—For construction of a wood lathe.

**846 CARR, T.** *New Ferry, near Birkenhead.*—For his disintegrator.

**180 DERING, G. E.** *Lockleys, Welwyn, Hertfordshire.*—For invention and progress in the construction of the permanent way of a railway.

**181 SALMON, J.** *8 Royal Exchange, Manchester.*—For ingenuity and progress in his machinery for printers, stationers, &c.

**183 BACON & WAYMAN,** *43z Barbican, London, E.C.*—For wire-work for papermakers.

**184 BOOTH, BROTHERS,** *63, Upper Stephen st. Dublin.*—For good collection of tools.

**185 BOOTH, H. & Co.** *Lady Day Spindle Works, Preston.*—For excellent spindles and flys.

**186 THE BROUGHTON COPPER CO. (LIMITED),** *Broughton Copper Works, Manchester.*—For a fine collection of copper tubes, &c., &c.

**187 HACKING & PARKINSON,** *Moorside Works, Bury, Lancashire.*—For excellent spindles and flys.

**188 IRVINE & SELLERS,** *Peel Hall Works, Preston.*—For good collections of wooden articles for spinning and weaving.

**190 MOORE & MAYBY,** *Dudley, and 3, Billiter sq. London.*—For collection of rolled iron.

**860 SKETCHLEY & Co.**—*Great George st. Weymouth.*—For universal joiner.

**861 PENN, J. & SONS,** *Greenwich.*—For models, and excellence of workmanship.

**863 TATHAM, J.** *Moss lane Works, and Milerow road Works, Rochdale.*—For excellence of design and workmanship in his machinery for spinning and weaving woollen goods.

**864 LAW S. & SONS,** *Cleckheaton, Yorkshire.*—For excellent cards for all kinds of fibrous materials.

**871 POWIS, C. & Co.** *Cyclops Works, Millwall Pier, and 51 Gracechurch st. London.*—For excellent wood-cutting machinery.

**872 HUGHES & KIMBER,**—*West Harding st. Fetter lane, London, E.C.*—For excellent machinery for paper cutting, printing, &c.

## BELGIUM.

**65 & 67 CAIL, J. F. HALOT, A. & Co. Brussels.**—For their locomotive, and various designs of tools.

## ZOLLVEREIN.

**44 HÜRDER BERGWERKE, & HUTTEN VEREIN,** *Hürde, Westphalia.*—For original plans and excellence of workmanship.

**45 PLASTIC CHARCOAL MANUFACTORY,** *15 Engel-Ufer, Berlin.*—For patent water filters.

**191a KRUPP, F.** *Essen, Rhenish Prussia, and 11 New Broad st. London, E.C.*—For progress in the manufacture of steel, in Section V.; also for the new invention of a steel 110-pounder gun in Section VIII.

## UNITED STATES.

**WARD, W. H.** *New York.*—For ingenuity in the construction of railway turntables.

## HONOURABLE MENTION.

### UNITED KINGDOM.

**75 MAITLAND, C.** *Alloa, Scotland.*—For an excellent self-acting brewer's mashing apparatus.

**77 GOODISSON, T. H.** *6 Serpentine avenue, Sandy-mount.*—For his models.

**86 JAMES, BROTHERS,** *15 Fish st. Hill, London, E.C.*—For covering for boilers.

**90 MORTON & WILSON,** *Stockton-on-Tees, Durham.*—For brass work.

**106 MARSDEN, H. R.** *Soho Foundry, Leeds, Yorkshire.*—For stone-breaking and crushing machines.

**108 MOSE, S. S.** *Balbriggan.*—For his linen powerloom.

**845 DEAR, J.** *Edinburgh and Glasgow Railway.*—For switch box.

## BELGIUM.

**66 AKERTS, BROTHERS & Co. Brussels.**—For ventilating apparatus.

## SECTION V. (C.)—CARRIAGES.

**Carriages.**—The changes in the construction of carriages indicate the progress of luxury amongst the wealthy, as well as that of locomotion generally. In the early ages of our history when highways were little better than what are called bridle roads, the use of carriages was, of course, out of the question; and how the nobility and gentry of those days moved about so much it is difficult for us to comprehend. Wheel carriages for pleasure are supposed to date from the reign of Elizabeth; but they were then clumsy articles, without springs, and with the then state of the roads they must have been exceedingly uncomfortable. At first, they were drawn by two horses, but the number was soon increased to four or six, according to the rank or wealth of the owner. In the reign of James I., the Earl of Northumberland, "hearing that the great favourite Buckingham was drawn about with a coach and six horses, thought he might very well have eight horses in his coach, with which he rode through the city of London." The use of carriages in those days was, however, chiefly confined to ladies. The historian of the times in which Sir Philip Sidney flourished said that it was then held a disgrace for a young gentleman to be seen riding in the street in a coach.

The extension of railways has effected a complete change in the style of the carriages of the gentry. In the early part of this century, they were made strong and serviceable, fitted for long journeys, and with corresponding arrangements for luggage. A journey of any length is, however, now seldom undertaken in a private carriage, and hence the carriages are made of

lighter and more elegant construction than in times past. This change has also been facilitated by the great improvement in the condition of our streets and roads, so characteristic of the present generation.

The carriage court of the Exhibition contains a highly satisfactory illustration of the vehicles in common use; and, with one exception, they are contributed by British and Irish coachmakers. It is not a little interesting to examine the geographical distribution of the manufacture, as thus represented. Dublin and London might be supposed to put in an appearance, as being to some extent centres of this branch of business; but we have also contributions from Belfast, Cork, and Wexford, on this side of the Channel; and from Edinburgh, Glasgow, Perth, Stirling, Liverpool, Derby, Nottingham, and Bristol on the other side.

Amongst the recent improvements in coach building is the introduction of Canadian black walnut, and American hickory; the former being peculiarly suited for pannels, and the latter for spokes of the wheels. In an article costing a large sum, such as a carriage in which the best workmanship of every kind is to be displayed, it is especially important that the best materials only should be employed, as the difference in expense between the good and the inferior article is altogether insignificant compared with the value of the carriage itself. The use of tough steel for iron in the construction of the lighter class of vehicles is also another great improvement, as it increases the strength while diminishing the weight. The introduction of the laced basket work as a substitute for panelling is a French invention. This

was made by hand in the first instance, but of late machinery has been employed for the purpose, which has secured a degree of uniformity and regularity in the work incompatible with hand labour.

The carriages in the Exhibition, as before stated, amply illustrate the vehicles at present in use, as well as the most recent improvements. In this changeable climate it becomes an important desideratum for those who keep only a single carriage to be able to adapt it for fair or foul weather; and a very satisfactory arrangement for this purpose is exhibited by Messrs. Morgan, Edgware-road, London (No. 137 in the Catalogue). By turning a screw, the head of the carriage can be opened or closed by the driver without leaving the box; and in addition to this great convenience this carriage is in every respect an elegant one.

The two carriages exhibited by Mr. Thomson, of Stirling, are eminently deserving of notice. The brougham is characterized by its lightness and elegance, as well as for excellence of finish, and the taste displayed in the fittings. A mirror is very ingeniously placed in the roof which can be suspended for use if a toilette is to be

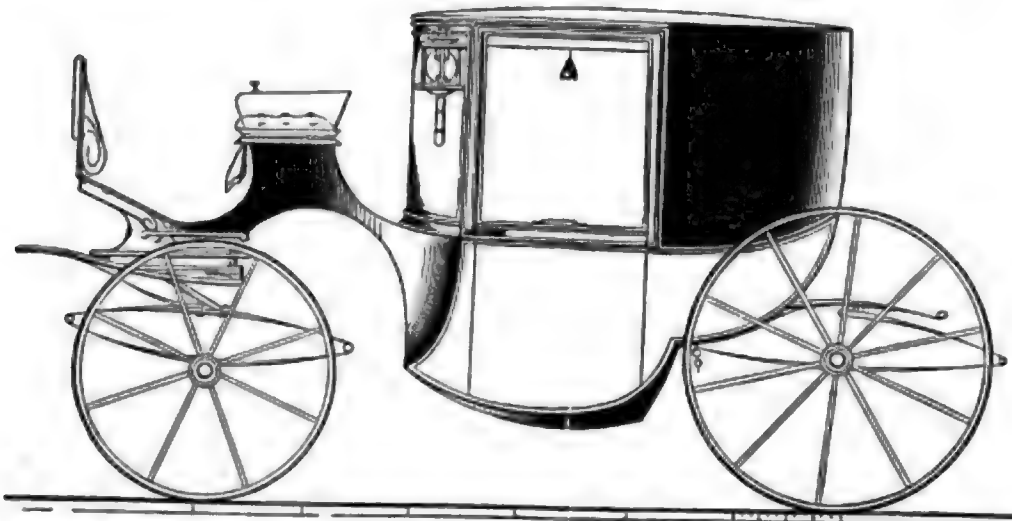
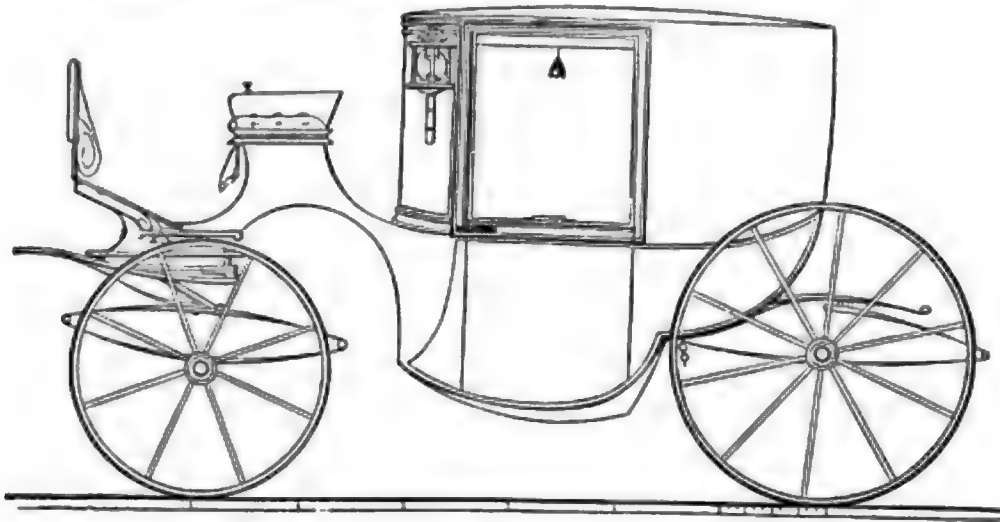
arranged. When only two persons use the carriage, the front seat may be let down, in which case it forms a bag for small parcels or travelling requisites. The arrangement for the axle is also calculated to add to the strength of the carriage without increasing its weight; and we may also notice the movable driving rail on the dash, which can be lowered or raised to suit the convenience of the driver. The second carriage exhibited by Mr. Thomson is a very handsome waggonette, provided with a movable top.

We feel assured that this is a kind of carriage which must come into general use, from its economical construction and great convenience.

Messrs. J. Macnee and Co., of Edinburgh, exhibit a very handsome circular-front brougham on C spring, which, though of apparently small size, affords ample accommodation for four persons. In decoration and general fitting-up this carriage is a model of good taste.

120 BROWNE, J. 167 Great Brunswick st. Dublin.—Outside jaunting car.

121 BUCHANAN, J. & Co. 339 St. Vincent st. Glasgow.—Four wheel clarence carriage.



122 EVANS, J. Patent Carriage Manufactory, 32 and 34 Tarlton st. Church st. Liverpool.—Improved cab and drag (registered).

123 GRADY, R. E. 38 Dawson st. Dublin.—New miniature brougham, with improved fore carriage

124 HAWKINS, J. 68 Capel st. Dublin.—Carriage lamps of various kinds; stable and yacht lamps.

125 HOLMES, H. & A. London road, Derby, Bird st. Lichfield, and 38 Margaret st. Cavendish sq. London, W.—Doctor's miniature brougham.

126 HOOPER & Co. 28 Haymarket, London, S.W.—Light Sefton landau and Sutherland barouche; drawings of carriages and harness.

127 HUTTON, J. & SONS, Summer hill, Dublin.—Brougham with circular front, and part sociable.

128 KENNEDY, J. & SON, 3 Montgomery st. Belfast.—Canoe landau, with hind rumble.

129 KESTERTON, E. 93 & 94 Longacre, London, W.C.—"Elcho Amempton" sociable, forming two carriages in one.

- 130 KILLINGER, C. 20 *Westland row, Dublin.*—Landau.
- 131 LEDWIDGE, BAGGOT, & Co. 55 *Talbot st. Dublin.* Perambulator.
- 132 MACNEE, J. & Co. 106 *Prince's st. Edinburgh.*—Circular front brougham.
- 133 M'DOWELL, J. 46A *St. Anne st. Liverpool.*—Patent drag.
- 134 M'NAUGHT & SMITH, *Worcester.*—Light landau.
- 135 MARTIN, C. C.E. 106 *Cheapside, London, E.C.*—Patent apparatus for opening and closing heads of landaus, &c.; patent carriage steps.
- 136 ANDREWS, P. 42 *Great Brunswick st. Dublin.*—Waggonette.
- 137 MORGAN, E. & G. 90 & 91 *Edgware road, London, W.*—Landau sociable, with patent for opening and closing the head.
- 138 OFFORD, J. & R. 79 *Wells st. Oxford st. London.*—Double seated brougham.
- 139 PETERS, T. & SONS, 96 *Park st. Grosvenor sq. and Upper George st. Portman sq. London, W.*—Light brougham; mail phaeton; coach carvings and heraldry.
- 140 QUAN, D. & S. *Coach Factory, 10 Talbot st. Dublin.*—Brougham; improved family waggonette; and in *Agricultural Department, Kildare st.* a waggonette, dog cart, and Whitechapel cart.
- 141 ROCK & SON, *Hastings, Sussex.*—Light pair horse waggonette; village cart.
- 142 ROGERS, W. & Co. *College place, Bristol.*—Victoria barouche phaeton; light Clifton waggonette.
- 143 SANDERSON, F. 34 *Lower Dominick st. Dublin.*—Improved private cab; perambulator.
- 144 STABEY, T. R. *Nottingham and Crystal Palace.*—Brougham; "Granville cart."
- 145 THOMSON, W. 40 *Canal st. Perth.*—Four wheel dog cart, (registered).
- 146 THOMSON, G. *Stirling.*—Light brougham, improved; and waggonette.
- 147 TORRINGTON, J. 37 *Mary st. Dublin.*—Perambulators.
- 148 WARD, J. 5 and 6 *Leicester sq. London, W.*—Pleasure-ground chair; self-propelling chair for the room.
- 149 WHITTINGHAM & WILKIN, 136 *Longacre, London, W.C.*—Carriage designs, hand coloured.
- 150 WINDOVER, C. S. *Huntingdon.*—Light dog cart phaeton (registered).
- 151 WOODALL, J. & SON, 28 *Orchard st. Portman sq. London, W.*—Circular fronted brougham; designs of modern carriages.
- 152 JOHNSON, J. *Nelson's place, Cork.*—Medium size brougham.
- 153 BATES & SONS, *Gorey, co. Wexford.*—Alexandrian phaeton, convertible into a waggonette.
- 154 PATENT CARRIAGE CO.—A cab.—(*Agricultural Hall, Kildare st.*)
- 154 STONEY, F. G. M. *Kyle Park, Berrisokane.*—Velocipede, with wheels peculiarly constructed.
- 155 GUY, R. *Rutland Mills, Dolphin's barn Bridge.*—Brougham, outside fly car, street cab, parcel van, axles.
- 155A SARGENT, *Paris.*—Invalid carriage and chair.

## JURORS' REPORT.

## NAMES OF JURORS.

- ARTHUR HOLMES, Derby, Carriage builder.
- GEORGE N. HOOPER, *Secretary and Reporter, London,* Carriage builder.
- T. MAXWELL HUTTON, *Chairman, Dublin,* Carriage builder.
- JOHN W. PETERS, London, Carriage builder.

The following firms exhibited carriages, a member of each firm having been selected as a juror, their carriages are thereby prevented competing for prize medals:—

No. in Catalogue.

- 125 Holmes, H. A., Derby, Lichfield and London, one carriage.
- 126 Hooper & Co., London, two carriages.
- 127 Hutton, J. & Sons, Dublin, two carriages.
- 139 Peters, T. & Sons, London, two carriages.

Analysis of Exhibitors and Contributions.

England:			
	Exhibitors.	Exhibitors.	Carriages. Carriages.
London, - 9 }		17	8 }
Provinces, - 8 }			12 }
Ireland:			
Dublin, - 12 }		15	9 }
Provinces, - 3 }			3 }
Scotland:			
Edinburgh, - 1 }		4	1 }
Provinces, - 3 }			4 }
Total British, - 36			
France (Paris), -	1		1
Norway (Drammen), -	1		2
Zollverein (Brieg), -	1		0
Gross total, - 39			

The carriages may be thus classified:—

	British. Foreign.		Total.
Phaetons, - - - -	5	1	6
Landaus, - - - -	5	-	5
Broughams, - - - -	11	-	11
Sociables, - - - -	2	-	2
Waggonettes, - - - -	5	-	5
Sleighs, - - - -	-	1	1
Barouche, - - - -	1	-	1
Private Hansom cab, - - - -	1	-	1
Cariole, - - - -	-	1	1
Outside car, - - - -	1	-	1
Town cars, - - - -	3	-	3
Clarence, - - - -	1	-	1
Private cab on four wheels, -	1	-	1
Pony cart, - - - -	1	-	1
	37	3	40

The number of exhibitors of the following are:—

	British. Foreign.		Total.
Carriage drawings and designs, -	8	-	8
" axles, - - - -	1	-	1
" lamps, - - - -	1	-	1
Perambulators and invalid chairs, -	4	-	4
Velocipede, - - - -	1	-	1
Carriage laces and trimmings, -	1	1	2
	11	1	12

Proportion of exhibitors to medals and certificates of merit:—

	Exhibitors.	Medals.	Certificate of Merit.
England, - 16	3		2
Ireland, - 16	3		3
Scotland, - 4	3		1
Foreign countries, 3	1		-
	39	10	6

Five English carriages belong to English Jurors, two Irish carriages belong to an Irish Juror.

Before proceeding to offer any remarks on the carriages shown at the Dublin International Exhibition, a glance at their position and mode of exhibition may be worth consideration.

Their locality, as regards convenient access to visitors, is much better than at the former Dublin Exhibition; they are, however, still treated as articles of very moderate importance, considering the great amount of care and minute supervision that is necessary for their proper proportion, construction, and finish. They should, therefore, be shown to advantage, in order to give exhibitors every chance of doing business, as a return for the expenses they inevitably incur in taking part in Industrial Exhibitions.

The building to receive carriages should be well lighted from the sides, care being taken that the rays of the sun, in hot weather, are not allowed to injure them; it should also be proof against rain and dust; in addition to this, there should be good ventilation, to prevent the accumulation of heated air in the department, which destroys the brilliancy of the varnish.

Experience seems to show that the most favourable manner of showing carriages together, is in parallel rows or avenues, each carriage being set obliquely; this is the arrangement followed in all the newest and best arranged show rooms for carriages in London and elsewhere. The reason appears to be this—that in order to see a carriage properly, and to judge of its proportions and merits, visitors should be able to retire to a distance to see the whole carriage at a glance; by placing them obliquely this is possible, even in a limited space, and in no other way, within a given area, can a number of carriages be properly inspected.

In more than one instance the Jurors have been informed that the carriages shown were not prepared for exhibition, but were merely ordinary carriages selected from the stock on hand. This can hardly be considered complimentary to the numerous visitors who come from afar, and at great expense, with the expectation that each manufacturer will show the best article he can produce; it is also hardly just to the exhibitor himself, who in each department or class is supposed to compete for a prize; he thereby much reduces his chance, in being surpassed by an enterprising and careful manufacturer, who uses every effort to raise the standard of his work, and for which purpose competitive exhibitions offer excellent opportunity.

On occasions like the present it is very desirable to mark the changes that have taken place not only in the construction of carriages, but the causes that have brought about these changes.

The first incentive has been the demand, on the part of the public, for lighter carriages, in consequence of the use of a smaller, lighter, and a more active breed of horses. The demand for such horses has been produced by the fashion for riding that is now so general; horses of the size used, averaging fifteen and a-half hands, are suitable for draught and for the saddle, they can be driven at greater speed, and do a longer day's journey than the large coach horses of former times.

A mode of construction that has opened the way for great and striking changes was introduced about the time of the first International Exhibition in 1851; it is technically known as the "cut through doorway," and its first constructor probably little thought of the numerous improvements that would follow the use of the plan.

In order to understand the new system, it is first necessary to explain the old one. All carriages require a strong and sound foundation proportioned to their size, and their proposed use; this consisted of a massive piece of timber generally cut out of planks six inches thick, on it were framed the uprights, to carry the doors, &c., and below it was fastened the locket or well, for the feet of the occupants.

The disadvantages of this plan were, a high projection to step over in entering the carriage; if for a landau, the panels were obliged to be made deep, to contain the glasses; the number of years it was necessary to keep the planks before they were thoroughly seasoned and fit for use; and if the panels were made shallow and graceful for a barouche, the folding steps, when not in use, projected in an unsightly manner above the doors.

By the new plan, which consists in so framing the bottom sides as to leave a gap in the centre for the door to reach down to the real bottom line of the body, the timber used need not be more than three and a-half inches thick, instead of six inches, thereby much reducing the time necessary to season it; the framing is also so reduced in depth at the doorway, that it is much more easily stepped over, especially by invalids and elderly persons; the doors are then made so as to reach to the bottom line of the carriage, enabling the glass to

fall so much lower, and thereby allowing the panels to be made shallower by depressing the elbow or waist line of the body. In the case of barouches, where fashion and good taste require the most graceful lines that good and sound construction allows, the folding steps are concealed from view when not in use, instead of causing a break in the top line of the body by their projection upwards; this mode of construction has further the advantage of enabling many carriages such as formerly required double folding steps, for persons to get into them, to be built in such a manner that an ordinary single step with its cover, acting like those used for broughams can be used; whereas, each of such carriages formerly was, of necessity, accompanied by a footman, to let down and fold up the steps; it is now optional whether a footman shall accompany the carriage; a point of much importance in small establishments. A minor advantage is, that the doorway which always becomes somewhat untidy by the chafing of the feet of persons entering and leaving the carriage, is concealed by the door, which, when closed, covers and conceals all such chafed parts from sight.

Other inventions affecting the mode of constructing the heads of landaus, especially in enabling them to fall low, and to avoid unsightly notches and breaks in the line of the head when open, have been made since the opening of the London Exhibition of 1862. Among these plans should be noticed "Morgan's ingenious patent," for opening and closing carriage heads, by means of a screw acting on a series of cranks and levers, so that by turning a handle fixed to the coachman's seat, the head is opened or closed without further interference.

The use of tough steel instead of iron gradually increases, and were its advantages and mode of treatment in working more generally known, would doubtless obtain much public favour. Attempts have been made to use it for carriage axles; and in the hands of skilful and careful manufacturers it would be a most useful addition to the aids for reducing still further the weight of carriages. The general manufacture of coach bolts, nuts, and screws of this useful and valuable metal, would also be a step in the right direction; they would have the advantage of great strength and toughness, and only small holes would be necessary to receive them; their use is almost solely delayed by there not being a constant supply in the ordinary course of trade. It would not answer the purpose of a coachbuilder to set aside his iron bolts unless he could feel sure that in changing his sizes he could have a supply of steel bolts at his command, and so prevent his work being stopped or delayed by a short supply in the market, or by any difficulty in replenishing his stock of such articles at short notice. There is here a good opening for a useful branch of trade.

It is pleasant and cheering to be able to refer to the increased skill and ingenuity of the coach-workmen, especially among the rising generation of operatives. This fact was elicited by the recent Industrial Exhibition of the Operative Coachmakers, held in February last, in the Hall of the Worshipful Company of Coachmakers of the City of London; not only were there then shown several excellent working drawings of carriages, drawn to scale, and difficult of execution, and showing that there are forthcoming more highly educated and more competent men, well acquainted with the details of their crafts, and of the proper and scientific manner of setting out their work, now that frequent change of construction so much requires this knowledge; but there were many very ingenious models of proposed improvements, showing that their originators were men of thought and energy. The Exhibition gave promise that at some future time (should a similar one be held) talent would be more fully developed, and the competition for prizes would lead to some very excellent productions by the operatives engaged in coachmaking.

While on the subject of the operatives engaged in the manufacture of carriages it may here be mentioned how

much depends on the workmen being able to obtain cheerful and healthy dwellings at moderate rents. This is a source of great difficulty in all large cities: the more highly paid and intelligent workmen, who are paid according to the quantity and quality of the work they produce, and who much value the lighter discipline they enjoy under this system, are enabled to live at greater distances from their work than those who are paid so much for a day's labour, and who, in order to comply with the hours of labour customary in the trade, are obliged to live in the neighbourhood of the manufacturer who employs them. Most business men in large cities know how depressing to the health and spirits is constant residence in a crowded and central neighbourhood, and how they take the first favourable opportunity of getting into the fresh country air. This same feeling is as likely to overtake the town workman and induce him to attempt its removal, but often in a different manner. The drain shop is near, and its look attractive—drinking may soon become a habit to a man of weak resolution, notwithstanding the warnings of conscience and of friends who see his error. Much has recently been done to rouse public attention to the many evils resulting from the unhealthy dwellings which so many of the industrious working men of the United Kingdom are forced to inhabit. Education may do much to enlighten the working population on the many blessings attending sound health in healthy homes, but much of the influence of the schoolmaster is lost when home is not attractive to the workman and his family.

Few greater benefits could be conferred on working men than the improvement of their homes; and now that many benevolent persons have perseveringly drawn public attention to the need, and that the subject is being ventilated in Parliament, it is hoped that something may be done. If Parliament cannot directly interfere in the matter, it may at least prevent the evil growing worse, and take some steps to promote private enterprise, and so encourage indirectly what has not been considered the duty of Government. It is even worth consideration whether the health and strength of the people, being of national importance—the wealth, prosperity, and safety of the kingdom depending on the strong arms and power of endurance of the people—should not receive the most earnest and careful watchfulness of Parliament, and, if necessary, be treated exceptionally, as no accession of wealth and luxury can compensate for a loss of vigour among the bulk of the population, and unhealthy homes sap the very foundations of health and strength, especially in populous cities. Before quitting the subject of the workmen engaged in carriage building it is desirable again to advert to the recently organized operatives' industrial exhibitions, and their influence on trade.

So much interest was shown by the London carriage workmen, and the committee of intelligent and enterprising operatives devoted so much time and attention to their Industrial Exhibition (which was the first of such exhibitions originated and carried out by the workmen of one particular trade), that its success may encourage other bodies of workmen to follow in their footsteps. Such an exhibition taken up by the most skilled and respectable workmen of Dublin, assisted by the masters, would, doubtless, meet with a success that would benefit the coachmaking trade of Ireland, by encouraging a higher degree of skill, by bringing classes together, leading to mutual respect and good will, and by the higher public consideration conceded to trades that can show united action in any work tending to the good of the community, and rendering men better citizens. Ireland has carried out with great credit to herself two International Exhibitions, and thus shows to the world that she possesses enlightened and energetic men, willing to devote their time, talents, and money to advance the prosperity of their country. The success of these exhibitions may encourage her further to develop their principle, by encouraging operative

industrial exhibitions, seeing the success they have met with in England, and the excellent opportunity they afford for encouraging skill and enterprise among working men. A branch of trade that has been successfully established in Dublin is the manufacture of carriage silks, laces, and trimmings; not only is Ireland supplied with such goods from Dublin, but being produced of sound and good quality, they compete successfully with those made in England, both for the home trade and for exportation to India and the Colonies.

There can be no doubt that since the first International Exhibition in 1851, when foreign countries were brought into a more sharp and active competition with Great Britain than in former years, many British manufacturers have had to contend with great difficulties and to effect great changes in their manufactures; notwithstanding this, they have done their best to hold their ground, but with disadvantages. It is not so generally known as it should be, that in France, Belgium, Germany, and some other European States, the training of workmen and apprentices receives great attention; the Governments in these countries considering money and trouble bestowed on such objects to be of national importance. Technical schools of these countries furnish instruction in drawing, modelling, the harmonious arrangement of colours, the application of chemistry to manufactures, metallurgy and the proper working of metals, the principles and application of mathematics and mechanics to manufactures, together with much that is strictly technical. In some parts of Germany before an employer of labour can commence business on his own account he must prove to competent persons, by the execution of his trial-work or "meister-stuck" that he understands what he undertakes; and, moreover, has travelled for three years in foreign countries, working at his trade, to acquire a knowledge of its processes in other countries besides his own; there is doubtless much pedantry in many of the regulations that interfere with the free exercise of trade; but culling the best points of the system there is much good that results. The training of apprentices in most trades in England is unsatisfactory, and were public attention directed to the matter, after discussing the subject in its different bearings, there might be some good general recommendations relating to the subject circulated.

The art of the coachmaker being an intricate one, inasmuch as he has to combine in one harmonious whole a number of most varied products—wood, iron, steel, brass, paint, silver, cloth, leather, silk, ivory, hair, carpet, glass, &c., &c., each worked by a separate trade, but generally in one manufactory, and each of which may be spoilt or injured by careless or improper treatment in any process—it behoves all engaged on the production of carriages to work in harmony, that their united labours may approach perfection. It would add much to this desirable end, if in each manufactory, large or small, were issued a series of printed "general directions," for conducting the work; not rigid rules that would, if strictly enforced, reduce men to mere machines, instead of free and intelligent operatives, but such as would so guide each worker in the execution of his work, as not only to give satisfaction to his employer by its excellent and honest execution, but bring equal satisfaction and credit to himself. This state of feeling would be a very desirable one to bring about; it would beget mutual trust and respect between employer and employed, and lead the way to a more cordial appreciation of each other's wants and difficulties; at the same time it would lessen the incessant watchfulness and anxiety necessary to ensure the work being executed in such a manner that it may be depended on for accuracy and excellence when completed.

Under the new law regulating friendly societies the London Coach Operatives have recently established a benevolent fund, which is supported by themselves as well as by the employers, such a fund being destined for charitable purposes only, and not for trades-union

purposes. There is thus being awakened a more united feeling of sympathy between employers and workmen, who are becoming more fully aware that they must rise or fall together, and as the goods of the best manufacturers generally fetch the best prices, so the employers would naturally be desirous to attract to themselves the best workmen, and pay them well for a high standard of skill and energy.

A feature in the financial department of coachmaking must not be overlooked, as it has much influence on an important trade. In former times a large proportion of carriages were built to order for the owners; the reverse is now the case, most persons select a finished carriage which pleases their taste, or an advanced one, and get it completed to their favourite colour. This, of course, necessitates the employment of larger capital to meet the altered state of trade, which now requires so large a stock of carriages to be kept ready for use.

The excessive competition of recent years has so reduced the profit on each carriage, that in order to carry on his business without loss, the builder has to require prompt payment from his customer, instead of leaving the time of payment uncertain. In fact, many manufacturers who have not been able to adapt their system of business to the necessities of the present time, have been obliged to give up the trade, which has fallen into other hands that have realized the obligation of change, and fallen in with the wants of the great body of carriage buyers.

The modern system enables a coachbuilder to make his purchases for ready money, and so buy not only better in quality, but at less cost than for extended credit, in order that he might in his turn give long credit to his customers, so that he is now obliged to depend on small profits and quick returns by turning over his capital more rapidly. He is not now, as much as in former times, the agent of the persons who supply the materials that he and his workmen convert into a carriage, but rather the designer, capitalist, and director of those who seek his service or custom, whether to supply labour or materials.

If the number of exhibitors really represents the trade of a locality whence they come, Dublin seems to be the chief manufacturing city in Ireland for carriages, as the whole of Ireland gives 15 exhibitors, of whom 12 are of Dublin, showing 9 carriages; the remainder of Ireland, giving 3 exhibitors, with 3 carriages. Scotland gives 4 exhibitors, of which number 1 is from Edinburgh, with 1 carriage; and 3 from the remainder of Scotland, with 4 carriages. England gives 17 exhibitors, of whom London has 9, with 8 carriages; the remainder of England, 8 exhibitors, with 12 carriages; so that all the English provinces together furnish rather more than the number sent from London: although in the latter city are made, and from it are sent a very large number of carriages to all parts of England, Ireland, and Scotland, as well as to most parts of the world where the duties on carriages are not excessive.

In close connexion with the art of carriage building should be considered that of road making. This latter is much indebted to the genius and energy of Englishmen who within the present century laid out, and established on a sound basis, the great system of English roads. They made a reputation by their ability, of which Englishmen may be proud. However, since the introduction of the railway system, the art seems to have slumbered in England. Not so, however, in France, and many parts of Continental Europe, where foreign engineers have taken up the art where English engineers left it.

In England the roads are only half made, or at least unfinished, and it is left to the feet of horses or the wheels of vehicles to crush together and compound the loose stones into a smooth mass as best they may. The result may be guessed; this uncouth and rude treatment, although in the course of time it effects its object, leaves the road uneven, with depressions that hold the water, and loose stones that obstinately refuse to mate with their fellows.

In France, the roads, when prepared with the last surface-dressing of hard broken stones are treated so as to finish them fit for traffic. Fine gravel is thrown on the broken metal, and slightly watered: a smooth, wide, and heavy roller is then drawn over it till the surface is compact and smooth enough for ordinary traffic, saving horses much unnecessary toil and suffering, besides avoiding the strain and injury to carriages and carriage wheels.

It is desirable to direct attention to the proper horsing of carriages, that the owners of horses and carriages may so adapt their plans as to get the most satisfactory result from their arrangements. Not unfrequently a carriage is ordered for one horse only. When it is partly made, or perhaps finished, fittings are ordered for two horses; and it sometimes happens that the two horses put to the light one-horse carriage are coach horses, between sixteen and seventeen hands in height. Such horses, although well adapted to a heavy family carriage, are quite out of their proper place attached to a light one. Although they can draw it at a good pace, and over almost any obstacle in the road, and do their journey without fatigue, the carriage suffers sooner or later. The lounging of such horses against a light pole, the strain thrown on the pole in case of a horse tripping, the certain breakage that must occur in case of a fall, and the risk of overturning the carriage, should all be considered before putting a very light carriage behind very large horses. It also sometimes happens that miniature broughams, and other very small carriages, built as light and as slight as safety will allow, are afterwards used with a pair of horses. In such cases if accidents do not occur through the great strain of a long pole acting as a lever on a very light mechanism, the parts become strained, do not work as they were intended to do, and necessitate constant repair from not being adapted for the work put upon them. Carriage owners should, in their own interest, have their carriages and horses suited to what they ought and can undergo, bearing in mind that there are advantages and disadvantages both with heavy and light carriages. The former are easier and more comfortable to ride in; they are safer for horses, drivers, and riders, and the necessary repairs are less frequently required. The lighter carriages follow the horses more easily, and can therefore do a longer day's journey; and although the necessary repairs may come more frequently, the saving of the horses may be an advantage that many persons will consider of the utmost importance. Such light carriages should, however, be made of the choicest materials and workmanship, that they may do the work required of them.

A custom has arisen of late years of driving horses without breechings. Although this may be quite satisfactory with light carriages, and on level roads, it is attended with much risk and danger in other cases; in descending hills the breeching brings the strain on the horses' hind quarters, besides relieving the strain on the pole. If the hind wheels are retarded by an ordinary drag shoe, or by the friction of a lever brake, the chances of accident are considerably reduced. In the plan now so common of using horses for all purposes without breechings, the pressure of a pole in descending a hill is thrown on the horse's neck, and thereby on his front legs. Everything now depends on the pole bearing the extreme strain without breaking, and the horses trotting steadily, for if a horse trips, shies at any object in the road, becomes scared by a railway whistle, or terrified by a flash of lightning, he gives a sudden snatch or jerk at the pole, and sometimes even the best of timber gives way, just as under certain conditions of wind and storm at sea, the best of masts may go overboard. Carriage owners and drivers should be aware of the means of safety within their reach. In hilly countries nothing equals the screw or lever break, by which a graduated pressure is applied to the circumference of the hind wheels; in most circumstances a carriage can be stopped when descending a hill, should the necessity

arise for so doing; and when it is considered that the precipitous slopes of the Alps are daily traversed at a trot by this contrivance, it may readily be perceived in how many cases it is not only a means of convenience (being worked by the driver), but of necessity for the safety of a journey.

It is a source of regret that public carriages were unrepresented in 1865; at the last Dublin Exhibition, 1853, one of Mr. Bianconi's compact and inexpensive four-wheel outside cars was shown, than which contrivance few are more suitable for conveying a large number of passengers on a minimum weight of carriage. Though somewhat unsuitable as regards shelter in bad weather, they possess many advantages over the conveyances known in London and elsewhere, as omnibuses. The weight was kept low, thereby affording safety in case of collision or breakage of any part, and the seats being low, were easily accessible for passengers to mount and alight quickly; if the passengers got wet, they at least had what is of infinite importance to human beings—fresh air. These conveyances have been copied and used with much success on the temporary railway annually laid down at the volunteers' camp at Wimbledon. As regards omnibuses, the chief defect is the wretched ventilation for the inside passengers, and the difficult and dangerous means of access for the outsiders; if it were known how much ill-health and pain were caused by inattention to these matters, all persons who cannot afford to keep private carriages of their own would feel interested in having them improved.

The interiors of omnibuses are, in fact, "hot air baths," in which heat and foul air are generated to a most injurious extent; thousands of business men in London pass daily an hour of their lives in this pernicious atmosphere, and the medical men of London could probably account for much of the low state of health of many of their patients from this cause. The means of ventilation are most simple, and police regulations should enforce their adoption in all public carriages of this class. The mere passing of the carriage through the air creates a current, and were openings made, front and back, allowing a stream of fresh air to pass along the inside of the roof, taking care that the current is led upwards, and not to the faces and necks of passengers, the arrangement would be a great public benefit; fresh air might also be easily admitted under the seats. The outside passengers deserve more consideration than they get, as regards their safety; many a sprained joint and injured limb is due to the defective arrangement of steps to mount and descend; and seeing that such passengers afford a large profit to the owners, they should receive that which is so essential to their comfort and safety. The introduction of the French plan of suspension is at last being adopted, much to the comfort of all omnibus riders in London, who, at least, should ride on as good springs as their Parisian friends and allies.

There seems to be at all industrial exhibitions a backwardness in sending public carriages for inspection and competition for prizes, probably from their solid and comparatively rough finish not being considered sufficiently attractive; it is, however, very desirable that such vehicles should be represented; the general public being deeply interested in their improvement. It is even worth a consideration if in such cases it would not be politic to offer one or more special prizes at future exhibitions, in order to attract exhibitors in this particular trade, for it is in reality a trade almost distinct from coachmaking as generally understood. It is not usually desirable to interfere with the course of trade, but when public interests are neglected and thereby suffer, it is desirable to recall public attention to its wants, and bring out men from the crowd who have intelligence and energy to meet such cases.

In support of the preceding remarks, the "Instructions from the Council of Chairmen to the Carriage Jury," in 1851, expressly directed their attention to "carriages for the public service" (*Official Report*, page

192). As His Royal Highness the late Prince Consort had so much to do in the general scheme of that Exhibition, if the special direction did not emanate from him, it may reasonably be supposed that he approved it, and that the comfort and convenience of carriages for the public service was by him considered to be of importance; not only did he personally direct the construction of some of the carriages made for Her Majesty, but in his wide and thoughtful care he desired that the public should have the benefit of improved and more suitable conveyances.

GEORGE N. HOOPER, *Reporter*.

## LIST OF AWARDS.

### MEDAL.

#### UNITED KINGDOM.

120 BROWN, J. 167 *Great Brunswick st. Dublin*.—For outside jaunting car of good construction, workmanship, materials, and high finish—colours in good taste.

121 BUCHANAN, J. & Co. 339 *St. Vincent st. Glasgow*.—For Clarence carriage of sound construction, workmanship, and materials.

124 HAWKINS, J. 68 *Capel st. Dublin*.—For carriage lamps of good construction, form, and finish.

132 MACNEE, J. & Co. 108 *Prince's st. Edinburgh*.—For segmental brougham, on and under C springs—good form, construction, workmanship, and materials—colours are well combined.

137 MORGAN, E. & G. 90 & 91 *Edgware road, London, W.*—For mechanical apparatus to open and close carriage heads.

141 ROCK & SON, *Hastings, Sussex*.—For waggonette of good proportions, construction, workmanship, and materials.

146 THOMPSON, G. *Stirling*.—For waggonette of good proportions, construction, workmanship, and materials.

148 WARD, J. 5 and 6 *Leicester sq. London, W.*—For pleasure-ground chair for invalids, good construction, easy, and comfortable.

559 FRY, W. & Co. *Kerrin st. Dublin*.—For carriage laces and trimmings of good quality.

#### ZOLLVEREIN.

46 SCHARFF, B. *Brieg, Silesia*.—For carriage laces and trimmings of good quality.

#### HONOURABLE MENTION.

#### UNITED KINGDOM.

122 EVANS, J. 32 & 34 *Tarleton st. Church st. Liverpool*.—For one-horse car of good workmanship and materials.

128 KENNEDY, J. & SON, 3 *Montgomery st. Belfast*.—For landau of sound workmanship and materials.

140 QUAN, D. & S. 10 *Talbot st. Dublin*.—For waggonette, compact and of good proportions.

144 STARKY, T. R. *Nottingham, and Crystal Palace*.—For Granville car of good workmanship and materials.

145 THOMSON, W. 40 *Canal st. Perth*.—For four-wheel dog cart of good workmanship and materials.

155 GUY, R. *Rutland Mills, Dolphin's barn bridge, Dublin*.—For carriage axles of good workmanship and materials.

## SECTION VI.—MANUFACTURING MACHINES AND TOOLS, AND PROCESSES OF MANUFACTURE.

(In Carriage Court.)

**163 BELL, R. A. & Co.** 25 *Little May st. Belfast*.—Sewing machines, with work done by same; embossing press, and double eyelet press.

**164 BRITISH SEWING MACHINE CO. (LIMITED).** 71 *Oxford st. London, W.*—Alexandra patent Lock-stitch sewing machines; folding sewing machine cabinet.

**165 CODY, P.** 30 *Mill st. Dublin*.—Lathes for the manufacture of mother-o'-pearl buttons, studs, sleeve-links, and ornamental carving; mother-o'-pearl shells; foreign shells, &c. &c.

**166 DAVIDSON, W.** 23 *Fleet st. Dublin*.—Manufacture of steel pens. Mr. Davidson is the only Irish manufacturer of pens, and it is due to him to state that he not only keeps pace with the improvements made by rivals in England, but that he has introduced several ingenious modifications of form. His pens have large reservoirs, holding more ink than would be required to fill a page of letter-paper. The material used is the very best, and the pens are rendered as flexible and as fluent as quills. The finish is very neat, and it is possible to go through a box without finding one pen inferior in form or elasticity to the others. Mr. Davidson consults the requirements of schools and offices. His school pen is the very best of its class which we have ever seen, and the finer descriptions are equal to the most delicate and trying kinds of scribbling, making fine and strong lines with the same neatness and precision. It is very gratifying that a Dublin manufacturer should be able in this department of work to compete creditably with long established and eminent English firms.

**167 GROVER & BAKER SEWING MACHINE CO.** 151 *Regent-st. London, W.* and 59 *Bold-st. Liverpool*. Agents in Dublin—Baylis Burkitt and Co. 85 *Grafton street*.



(Price medal awarded.)

Shuttle or Lock-Stitch. Elastic or Double Lock-Stitch.

Experience has proved that there are only two valuable sewing machine stitches—the Grover and Baker stitch, and the Shuttle stitch, by some called lock-stitch—and this Company exhibits machines of both classes. Manufacturers of shuttle-stitch machines only call them “lock-stitch,” to produce an impression that they make a secure and permanent stitch, but all such machines, whether operating with a shuttle, or with a bobbin and rotary hook, make the *shuttle stitch* and *nothing else*, and none of the infirmities of this stitch have been obviated or got rid of by the change of name.

Shuttle-stitch machines are not, and necessarily cannot be, equal to Grover and Baker stitch machines for *family use*, or for those kinds of work where elasticity and strength, as well as beauty of stitch, are required, nor, indeed, for any work which is to be *washed and ironed*.

Beautiful embroidery can be done by the Grover and Baker stitch machine, simply by inserting threads of suitable relative sizes and colours. The shuttle stitch cannot be used for embroidery.

These machines stitch, hem, fell, tuck, gather, quilt, bind, braid, and embroider; and some of their peculiar advantages are:—

No necessity to re-wind the under thread.

No taking apart to oil or clean.

No variation of the tension on the thread.

No necessity to fasten the ends of the seam, which, though it will neither run nor ravel in wear, can very easily be removed after proper instructions.

For many manufacturing purposes, however, the shuttle stitch is a necessity, and answers well. To meet this requirement, the Grover and Baker shuttle machines combine all the latest improvements to ensure ease in working, speed, and durability.

Every machine is guaranteed. Instruction gratis. Descriptive catalogues, with samples of work, free by post. Prices from £9, upwards.

**168 GUINNESS & Co.** 42 *Cheapside, London, E.C.*—Patent sewing machines.

**169 MORISON, W. M.** 23 *Bachelor's walk, Dublin*.—Printing in chromo-lithography, and specimens of lithographic work in every variety.

**170 SIMPSON, R. E. & Co.** 90 *Maxwell st. Glasgow*.—Double acting and other sewing machines, and samples of work.

**171 THE SINGER MANUFACTURING CO.** 69 *Grafton st. Dublin*.—Sewing machines.

**172 BISSELL, W.** *Wolverhampton*.—Saw-bench; mortising and planing machines.—(*Agricultural Hall, Kil-dare st.*)

**173 WHEELER & WILSON,** 139 *Regent st. London, W., and Liverpool*.—Lock-stitch, and other sewing machines.

But little more than ten years since the soft click of the Wheeler and Wilson sewing machine was first heard. Simple, quiet, and efficient, it made friends wherever seen. The highest honours were accorded it from the Atlantic to the Pacific, from the Lakes to the Gulf. Industrial, mechanical, and agricultural associations have crowned it with the highest honours, and hundreds of country and village fairs have been honoured in honouring it.

Abroad its record has been no less marked and honourable. At Paris, in 1855 and 1861; London, 1862; Linz and Koenigsberg, 1863; Dantzic, Agram and Krems, in 1864; and in 1865 at Dublin, Stettin, Cologne and Wismar; and last, but not least, at Dunedin, in New Zealand, it has won the highest awards. Thus from San Francisco eastward it has carried the American name and fame around the globe.

What varying emotions it has excited. In civilized lands women have welcomed it as a deliverer from wearisome bondage. The Indians of North America watched its workings with astonishment, whispering “Angamocser Maniton” (Sewing Spirit); the ignorant masses of Europe and Asia would not have been more surprised, if the old castles had taken to themselves legs and waddled off. In its beneficent mission it seems destined to bless all the families of the earth.

The success of this invention, marvellous as it may seem, is easily explained. It met an urgent want. At enormous expense, public opinion was educated to appreciate it. The Company has scrupulously fulfilled all its promises and obligations, and sought, as far as possible, honourable men as its representatives. It has ever found its highest interest in the interest of its customers, and is meeting its appropriate reward.

It is simple, not easily put out of order when in proper hands, and, in point of effectiveness and finish, no other machine stands ahead of it. This famous sewing-machine is highly appreciated the world over. A recent number of the *New York Scientific American* states:—

These machines have made and sold during the last three months about 10,000 machines, and are now

producing and selling 150 per day. They vary in price from \$50 to \$100, and the highest priced ones sell best. In their business there is over \$1,000,000 invested, and they keep 900 men regularly employed manufacturing machines. The system pursued is the same as that adopted in the manufacture of arms; every piece is made to a gauge, and consequently the parts of any machine may be transposed with those of another machine of the same size; or should an accident occur, the broken part can be immediately replaced on application to the office.

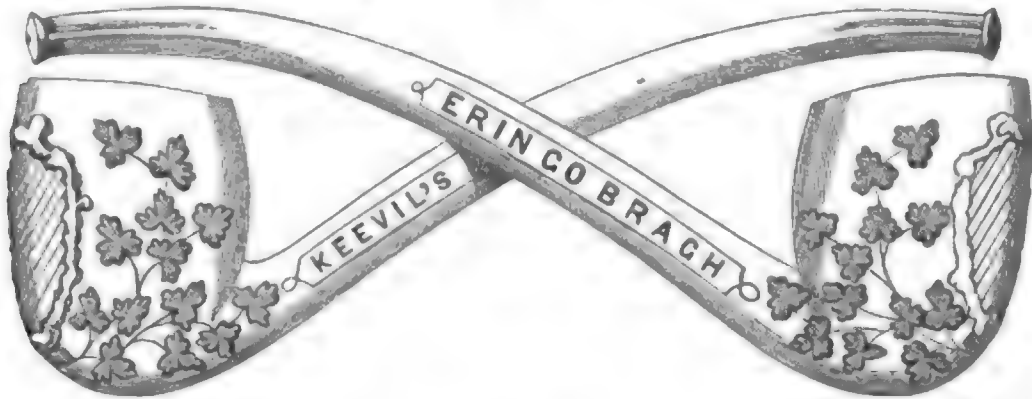
There is not an establishment in this country, where stitching of any kind is required, in which the sewing-machine is not employed; and there are few private families in which it is not an acknowledged article of

furniture. This Company has just carried off a medal at the International Exhibition, Dublin, exhibiting its 200,000th machine, beautifully ornamented with the American coat of arms.

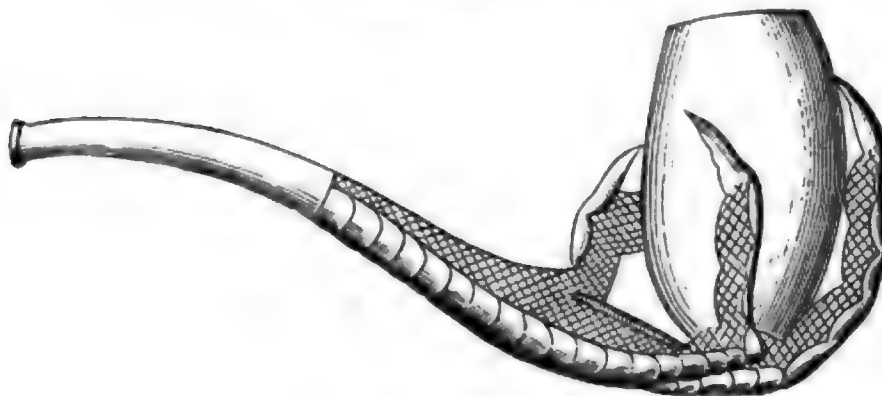
176 WILSON N. & Co. 144 *High Holborn, London, W.C.*—Patent lock-stitch, knitted-stitch, manufacturing, and other sewing machines.

177 LINDLEY, TAYLOR, & Co. *Manafield road, Nottingham.*—Machines for whipping blankets; for sewing or embroidering the edges of lace, muslin, and woollen articles; for making and applying fringe to the edge of fabrics, &c.

178 KEEVIL, EDWARD, *Dublin.*—Manufacture of pipes.



Irish Pipes.



Moerschbaum Pipes.



Briar Root Pipes.

A few short words about pipes, pipe-making, and smoking, will be read with interest by those of our readers who use the "social tube;" and as smoking of tobacco has become so prevalent a practice among most nations that pipe-making has grown to be a considerable branch of industry, we can imagine that the first pipe was formed of rolled paper or of a dried leaf enclosing the tobacco, and that a wooden pipe would follow this in the march of improvement. The origin of the common clay pipe may have been thought scarcely worth noting, but we may well suppose it was a date considerably later than that of the introduction of tobacco into Europe. King James VI. wrote his *Counterblast* to tobacco in 1619, wherein he complained "that some of the gentry of the land bestowed three and some four hundred a year on this precious stink." The pipes of the opulent were then made of silver, and in the form of a woodcock's head; the common people's pipes were made of a walnut shell and a straw. The small pipes dug up in this country and called "Danes" and "fairy-pipes" are of the kind used from 1600 to 1650, and on close examination the date is sometimes found on the heel of the pipe, which was then made sufficiently large for the pipe bowl to stand erect upon, so as not to waste its "precious" contents when not in actual use, as we find that Aubrey wrote in 1680, that in England the farmers "used to pick out their biggest shillings to lay in the scales against the tobacco," thus making its value equal to silver. Pipes of clay were used by the native Indians of Virginia in 1585. Of late, in this country, through the energy of Mr. Keevil, the extension and improvement of this industry has been rather remarkable. Fancy and fashion have connived to produce this change. Pipes are as various in quality and price as the circumstances of those who use them—from the native dudheen of the humble labourer to the amber-mouthed meerschaum, or the happy medium, the briar root pipe, which was introduced into this country by Mr. Keevil. But the manufacture, at present, of those pipes is entirely in the hands of France and Germany. The substance meerschaum is known to the chemist as a silicate of magnesia. It occurs in veins or kidney-shaped nodules among rocks of serpentine, chiefly at Kilschik, in Asia Minor. It is also found in parts of Greece and Piedmont. When first dug up it is soft,

and lathers like soap, on which account it is used by the Tartars for washing linen. The pipes, when made are prepared by first soaking in tallow, then in wax, and finally polishing them. The common pipe-clay used in this country comes from Devonshire; but although there is a quantity of the material in the West of Ireland, yet from the expense of carriage and other causes, it can be landed at the North-wall at very considerable less price from Devonshire than from Mayo, though Mayo is only a quarter the distance. We understand Mr. Keevil is negotiating to remedy this evil, and now, leaving the subject, wish him success.

179 PIM, BROTHERS, & Co. Great George's st. Dublin.  
—Poplin loom.

#### NAMES OF JURORS.

JULIUS DIEFENBACH, Ass. Director of the  
R. Chamber of Commerce, Stuttgart, . Zollverein.  
R. MALLEY, F.R.S., Civil Engineer, . London.  
A. MACDONNELL, Locomotive Engineer,  
Great Southern and Western Railway, . Dublin.  
ALFRED TYLOR, F.G.S., Brassfounder, . London.

#### LIST OF AWARDS.

##### MEDAL.

#### UNITED KINGDOM.

163 BELL, R. & Co. 25 Little May st. Belfast.—For their sewing machines.

164 BRITISH SEWING MACHINE Co. (LIMITED), 71 Oxford st. London, W.—For their sewing machines.

165 CODY, P. 30 Mill st. Dublin.—For excellence in the manufacture of mother-o'-pearl buttons, ornaments, &c.

166 DAVIDSON, W. 23 Fleet st. Dublin.—For excellence in the manufacture of steel pens.

167 GROVER & BAKER SEWING MACHINE Co. 150 Regent st. London, W. and 59 Bold st. Liverpool.—For their sewing-machines.

168 GUINNESS & Co. 42 *Cheapside, London, E.C.*—For their sewing machines.

170 SIMPSON, R. E. & Co. 90 *Marxwell st. Glasgow.*—For their sewing machines.

171 THE SINGER MANUFACTURING Co. 69 *Grafton st. Dublin.*—For their sewing machines.

173 WHEELER & WILSON, 139 *Regent st. London, W. and Liverpool.*—For their sewing machines.

178 WILSON, NEWTON, & Co. 144 *High Holborn, London, W.C.*—For their sewing machines.

177 LINDLEY, TAYLOR, & Co. *Mansfield road, Nottingham.*—For ingenuity, novelty, and progress in their sewing machines.

#### HONOURABLE MENTION.

#### UNITED KINGDOM.

178 KEEVIL, E. *Dublin.*—For excellence in manufacture of pipes.

### SECTION VII.—CIVIL ENGINEERING, ARCHITECTURAL AND BUILDING CONTRIVANCES.

#### South Side of Nave.

191B THE BUTTERLEY COMPANY, *Alfreton, Derbyshire.*—Solid wrought-iron beams and girders.

192 CLAYTON, W. 40 *Waterloo road, Dublin.*—Designs for Italian villas, and Gothic Church; models of Lisadell Court, co. Sligo, and of park entrance to same.

193 GORMAN, W. A. 5 *Denmark st. Soho, London, W.C.*—Siebe's patent diving apparatus.

194 HEELEY, J. C. 59 *Wellington st. Dublin.*—Model of wrought-iron lattice bridge on the Dublin, Wicklow, and Wexford Railway over the river Ovoca.

195 SIEMENS, BROTHERS, 3 *St. George's st. Westminster, London, S.W.*—Improved telegraph recording instrument; magneto-alphabetical telegraph, with alarm; railway alarm; electrical testing instrument; resistance coils; galvanometers; induction coil; tubular iron telegraph posts and insulators; submarine cables, &c.

This stand illustrates recent improvements in the art of telegraphy. Messrs. Siemens, Brothers, telegraph contractors, show an interesting collection of instruments for telegraphy and other electrical applications. Amongst the most recent inventions is the modification of Professor Morse's recording instrument, by which messages are permanently recorded in ink upon the paper, instead of being embossed as heretofore. The advantage offered by this improvement is in the capacity of the instrument to work, with very weak currents, such as often result from long or faulty lines, in the direct circuit without the intervention of a relay. Another equally useful system is the dial, or alphabetical telegraph, to work which the operator requires no previous instruction. This telegraph is constructed on the step-by-step principle. The indicators are moved by means of magneto-electric, and not voltaic currents; thus avoiding the inconvenience and expense attending the employment of batteries. We understand that these instruments are used exclusively by the London and Edinburgh Fire Brigades, and on some private lines between the offices and shops of manufacturing firms. Siemens' hotel telegraph is well worthy of the especial attention of the proprietors of our large hotels. The system is the same as that in use in the Hotel du Louvre, and the Grand Hotel in Paris, and the Charing Cross, Victoria, and other large hotels in England. The electrical system bids fair to supersede the ordinary mechanical system of bell ringing in hotels and other large houses. By the system in question, instead of requiring a bell for each room, a single bell is made to do all the sounding duty, and the room which calls is indicated by the presentation of a number before a transparent space in a glass frame. The frame, with as many transparent spaces as there are rooms or bell pulls, is fixed up in a conspicuous position in the office below. Immediately over this the alarm bell is placed, and in each of the rooms is a bell-pull, consisting of a small disk of mahogany with an iron knob in its centre. When this knob is pressed in,

the electric circuit is closed, the current passes through the wires connecting the knob with the alarm, the bell is rung, and, at the same time, a number corresponding with that of the room in which the knob was pressed, is shown at one of the little transparent spaces in the frame. This number remains there until it is seen by the attendant, who replaces it by simply touching a spring underneath the frame. The advantages of the method are obvious: stretching of wires and bending of cranks are impossible, the wires being absolutely at rest, traversed only by the electric fluid, and no cranks being employed.

The new cable shown by Messrs. Siemens consists of the combination of seven or more separate lines, enclosed within the space ordinarily occupied by a single iron wire line. It is proposed, by the employment of this cable upon the ordinary overland lines, to reduce the bulk of the net work, and, consequently, the strength of the supports, while the appearance of the lines will be materially improved. Such systems have been for a long time in use in the metropolis of England, in the service of the Universal Private Telegraph Company; but the specimens sent here surpass the previous attempts in the smallness of the space occupied, and in the excellent insulation of the separate wires. While proposing to diminish the bulk and weight of overland lines, Messrs. Siemens have made also a good provision for strength in their supports for those lines where a great number of separate iron wires is unavoidable. It is well known that the best wooden telegraph posts seldom last longer than six, never longer than ten, years. The rotting process has been retarded sometimes by the different methods of exhausting the sap, which is the immediate cause of the rotting, and by the injection of preservative matters, such as chloride of zinc and sulphate of copper, into the pores of the wood. In spite of all this, however, telegraph posts persist in rotting, and the companies find an extensive item in their yearly balance sheets to meet their replacement. Messrs. Siemens have constructed a post of iron which is calculated to withstand the action of the elements for a space of time at least ten times as long as a wooden one, under the most favourable circumstances, possibly could, while its cost does not exceed three times that of a wooden one. Those interested in the more scientific part of telegraphy will find worth especial attention a beautiful arrangement of Wheatstone's differential resistance measures adapted, with a series of commutations and resistance coils, for the various quantitative measurements which fall to the task of the telegraph engineer. One of the most common uses of this somewhat complicated piece of mechanism is the determination of the distances and magnitudes of faults in submarine cables.

Beyond these things which we have enumerated, we may still mention a new mine exploding apparatus,

sundry specimens of cables submerged in different seas by Messrs. Siemens, and the signalling apparatus between the engine and boiler rooms in the Machinery court—also the work of these manufacturers.

**196 HIPPIUS, A.** 37 *Russell sq. London, W.C.*—Drawings and description of Russian brick stoves; models of the same.

**197 BEARD & DENT,** 21 *Newcastle st. Strand, London.*—Cast lead traps.

**874 JENNINGS, G.** *Palace Wharf, Stangate, London, S.*—Lavatories and sanitary appliances.

*Our Homes considered in relation to Health and Comfort.*—A house, in the general acceptation of the term, may be defined as an enclosed space—a place of human abode; and its construction must have been one of the earliest arts known in the infancy of the world, for man, naked and defenceless, soon found it necessary to shelter himself from the inclemency of the weather, from the attacks of wild beasts, and the invasion of savage neighbours.

He could not lie down to sleep in comfort until he had built for himself a hut, which, however rude in appearance, served the purposes of shelter and defence. This was the origin and object of building which contained the germs of those wonderful edifices that now adorn the earth.

Civilization and architecture have ever gone hand in hand together, and the several orders mark their growth from the sturdy strength of the Doric to the graceful elegance of the Corinthian.

The softening influences of Art all will admit, and there can be no question that men's natures are much influenced by the character of their homes. This being a fact, the intelligence of the age, and the advance made in practical science lead us to inquire if homes (of every class) as at present constructed for the reception of human beings (and in which females and children spend so large a portion of their lives), are based on proper principles.

The interior of a properly constructed house should be free from the influence of atmospheric changes. Cool in Summer, warm in Winter, and dry at all times.

The foundations should always be above some outfall, be well drained, and every care taken to prevent damp rising; and arrangements should also be made to insure a healthy circulation at all times in every part of the house, particularly during the night.

A house may be well planned and architecturally perfect, yet if these conditions be overlooked or neglected "health and comfort" must suffer.

Acts of Parliament have been passed to prevent overcrowding and to render house drainage compulsory, yet no principle is satisfactorily determined in relation to the construction of buildings for the admission of air at a proper temperature (or in such a way as to avoid draught), or for its extraction after use.

The perfection of our houses and public buildings depends at this time entirely on the sanitary knowledge of the architect who may be called upon to design them, and who, intent upon the beauty of the structure he designs, makes no provision for an air supply to the rooms that he may have otherwise satisfactorily planned; and, as a consequence, rich as well as poor, by continually respiring the same air within the rooms they inhabit convert it into poisonous gas, most injurious to health, and rise from their beds unrefreshed and unfitted for the duties of the day.

Half the complaints that afflict humanity proceed from the total disregard or ignorance of the first conditions of animal health.

Man was not thrown upon the earth by the hand of chance to vegetate like the rest of the animal creation, to suffer much, to enjoy little, and to die as if he had never lived: his "health and comfort" will ever be proportioned to his knowledge of the science of life; and if this formed part of the education of all classes, the result would be increased comfort and physical improvement.

All men should endeavour to promote the "health and comfort" of their fellow men, and try to leave the world better than they found it; and all may more or less do so—some by calling attention to the requirements of the age; while others, having more practical ability, may bring about results beneficial to all.

However imperfect these suggestions may be, they may induce thought in others, and I trust the result will be, increased comfort and health to all.

**GEORGE JENNINGS,** Sanitary Engineer,  
Palace Wharf, Stangate, London, S.

**875 CENTRAL COTTAGE IMPROVEMENT SOCIETY,** 37 *Arundel st. Strand, London, W.C.*—Model of Exhibition cottages of 1862, copied by artist's pupil, Earlswood Asylum; model and plans of a single cottage; model of a double cottage.

**875A MEERY, J.** *Chestnut place, Dublin.*—Models of churches, &c.

**875B EDWARDS, H. E.** *Albert place, Dublin.*—Patent window sash.

#### NAMES OF JURORS.

<b>F. BARRINGTON,</b> Engineer-Surveyor to the	
Board of Trade,	Dublin.
<b>C. COTTON, C.E.,</b>	Dublin.
<b>Captain A. St. G. CUFF,</b> Agent for Canada,	Canada.
<b>ALFRED TYLER, F.G.S.,</b> Brassfounder,	London.

#### LIST OF AWARDS.

##### MEDAL.

#### UNITED KINGDOM.

**193 GORMAN, W. A.** 5 *Denmark st. Soho, London, W.C.*—For Siebe's patent diving apparatus, adapted for working in deep water.

**195 SIEMENS, BROTHERS,** 3 *St. George st. Westminster, S.W.*—For a fine collection of excellent electric apparatus for telegraphic purposes.

**197 BEARD & DENT,** 21 *Newcastle st. Strand, London, W.C.*—Cast lead traps; for invention, excellence of workmanship, and ease of application.

**874 JENNINGS, G.** *Palace Wharf, Stangate, London, S.*—For the general excellence of his collection, and for novelty of construction, especially in force pumps, in Section VII. Also, for lions and elegant vases in terra cotta, in Section XXVII.

#### BELGIUM.

**71 DELPERDANGE, V.** *Brussels.*—For his novel, simple, and very effective method of joining gas and water pipes.

#### FRANCE.

**36 GRENET, E.** *Paris.*—For his electric bells, and the construction of his constant voltaic battery.

**37 MOSSELMANN & Co.** *Paris.*—For the use of lime for sanitary purposes, and for the apparatus used.

#### HONOURABLE MENTION.

#### UNITED KINGDOM.

**192 CLAYTON W.** 40 *Winterloo road, Dublin.*—For well executed architectural models.

**194 HEKLEY, J. C.** 59 *Wellington st. Dublin.*—For a well executed model of a wrought-iron lattice bridge.

**196 EDWARDS, H. E.** *Albert place, Dublin.*—For a mode of hanging ordinary window sashes.

## SECTION VIII (A).—NAVAL ARCHITECTURE.

## Corridor at West End of Carriage Court.

198 HENWOOD, C. H.—Model of a steamship, and diagrams illustrating its construction.

199 THE MILLWALL IRONWORKS AND SHIPBUILDING COMPANY (LIMITED)—Model of H.M.S. Northumberland.

200 CLIFFORD, C. 3 *East India* avenue, *Leadenhall st. London, E.C.*—Working model of patent system of unlashing and lowering ships' boats, adopted by the Admiralty, &c., &c.

201 CONLAN, W. J. *Dalton villa, Merton road, Liverpool.*—Model of schooner yacht.

202 GIBBORNE, F. N. 445 *West Strand, London, W.C.*—Patent electric signals for ship-steering, mining, &c.

203 LUMLEY, H. 18 *Leadenhall st. London, E.C.*—Models of the Lumley rudder.

204 NUNN, W. 179 *St. Georges' st. East, London, E.*—Patent ship and boat lamps; Admiral Fitzroy's warning night signal lamps and lenses; Commander Colomb's patent flashing day and night apparatus; Lieut. Key's patent fog horn.

205 OLIVER, G. & J. 286 *Wapping, London, E.*—Record buoy; masthead and side lanterns; model of "Irene," Trinity steam yacht, with lanterns attached; oil-filler, &c.

206 SCALLAN, M. *Ringsend, Dublin*—Models of trawlers, yachts, &c.

207 WALPOLE, WEBB, & BEWLEY, *Port of Dublin Yard, North Wall, Dublin.*—Models of ships, and of new patent boiler.

Messrs. Walpole, Webb, and Bewley's ship-yard has been in operation about four years, being the first and only concern of the kind in Dublin. Amongst the principal ships built have been the "Knight Commander,"

sailing ship, 210'  $\times$  36'  $\times$  25' 3"; gross register, 1,434 tons; was one of the three vessels that rode out the cyclone at Calcutta in safety. "Caldbeck," sailing ship, 180  $\times$  30  $\times$  19' 6"; 787 tons. "Anna Liffey," paddle steamer, 190  $\times$  20  $\times$  8' 6"; 100 n.h.p.; engines by Macnab and Co., Greenock; boiler by Walpole, Webb, and Bewley; is a saloon river steamer, and plies between Dublin and Kingstown. "British Nation," sailing ship, 212  $\times$  36  $\times$  23' 3"; 1,302 register tonnage. "Dublin," screw steam collier, 175  $\times$  28  $\times$  14'; 80 n.h.p.; 660 tons. "Lady Wodehouse," screw steamer, 225  $\times$  28  $\times$  16'; 735 tons; 180 horse power; for plying between London and Dublin. Have also in hand a large fleet of iron fishing luggers, and a steamer for the Irish Sea Fishery Company; besides marine and land boilers and engineering work.

208 WARNOCK, W. H. 33 *Queen's sq. Dublin.*—Model of a merchant vessel.

209 LAIRD, BROTHERS, *Birkenhead.*—Model of the City of Dublin Steam Packet Company's mail packet, "Connaught."

876 PENINSULAR & ORIENTAL STEAM NAVIGATION Co. 132, *Leadenhall st. London, E.C.*—Model of steamship "Goleonda."

877 SIMONS, W. & Co. *London Works, Renfrew.*—Models of steam ships and of dredging barges.

878 WOOD, J. W. *Harrick.*—Model of a portable life raft.

879 USSHER, R. *New row, Dublin.*—Model of vessel driven head to wind.

880 TULLY, Captain K. *Toronto, Canada West.*—A propeller.

## SECTION VIII.—(B).—MILITARY ENGINEERING, ORDNANCE, ARMOUR, AND ACCOUTREMENTS.

## East End of Nave.

In this section the attention of the visitor was first challenged by a pair of huge Armstrong guns, sternly positioned at either side of the approach to the Carriage Court, their muzzles pointing down the nave, as if ready to make a clean sweep of all parties therein assembled. The "Story of the Guns" has been written, and not impertinently, for how it came to pass that the old and ugly, and, as it now appears, comparatively ineffective field and ship cannon were gradually modernised and improved into symmetrical, beautifully finished, and awfully destructive engines known as the Armstrong and Whitworth guns is surely interesting and instructive to hear. The two guns now in question are fine specimens. The low and murderous looking one to the left is a naval gun, smooth bore and muzzle loading; the larger to the right is a rifled fortification gun, breech-loading, and combining in its detail the most recent improvements. Though there are much larger guns than these made, yet this brace seems large enough for anything. The smooth bore weighs seven tons without its carriage, the rifled gun ten tons, and each is capable of speeding 110lb. iron shot, lead-coated, several miles distance, warranting that the said shot shall make clear holes through any little obstructions in the shape of either men or metal that may happen to be in the way. To the left was shown the machinery by which cannon

are "rifled;" also a field ammunition cart, an armourer's field forge and bench, and a series of Enfield "inter-changeable" rifles, in different stages of construction, each rifle, it is stated, consisting of 61 separate parts, comprising 732 distinct pieces. A collection of finished rifles was also shown, together with war accoutrements, helmets, swords, cutlasses, pistols, &c. All the exhibits enumerated were sent to the Exhibition by the Secretary of State at War, from the Royal Arsenal, Woolwich.

210 BAKER, F. T. 88 *Fleet st. London, E.C.*—Breech and muzzle-loading double guns; breech-loading double rifle and pistols; apparatus, &c., &c.

211 GREENER, W. W. *St. Mary's Works, Birmingham.*—Breech loaders and rifles; sword-bayonet.

212 KAVANAGH, W. & J. 12 *Dame st. Dublin.*—Double and single breech-loading shot guns and rifles; muzzle-loading double and single shot guns and rifles; breech loading revolver.

213 MCCALLUM, D. *Octagon, Plymouth.*—Patent distance indicator, for rifle practice.

214 SMITH, J. *Rifle Works, Loveday st. Birmingham.*—Patent self-locking breech-loading guns and rifles; revolving pistols; gun implements; breech-loading guns in different stages of manufacture.

215 THOMPSON, A. & SON, 16 Union place, Edinburgh.—Pair of breech-loading double guns, in case; breech-loading double guns and rifles.

216 TRULOCK, BROTHERS, 11 Essex quay, Dublin.—Breech-loading and double guns; rifle; breech-loading barrels; pistols; revolver.

217 RIGBY, W. & J. Suffolk st. Dublin.—Rifles.

218 TRULOCK & HARRIS, Dawson st. Dublin.—Rifles.

219 RICHARDSON & SONS, Cork.—Rifles and sporting guns.

220 THE SECRETARY OF STATE FOR WAR:—

A. From the Royal Gun Factories, Woolwich, Colonel F. A. Campbell, R.A., Superintendent.—Muzzle loading smooth-bored gun, for sea service; breech-loading rifled gun, for land service; breech-loading rifled 12-pounder field gun; rifling bars; tube rifled in various ways; gauges.

B. From the Royal Carriage Department, Woolwich, Colonel H. Clerk, R.A., F.R.S., Superintendent.—Naval carriage and slide; garrison carriage on a dwarf traversing platform; field gun carriage, and limber; forge waggon.

C. From the Royal Laboratories, Woolwich, Lieutenant-Colonel E. M. Boxer, R.A., F.R.S., Superintendent.—Collection of war material, containing:—

1 Shell (Mallet) 36 inches diameter, surrounded by four sets of sand shot, from 4lb. to 4oz.

2 Boxer, parachute light ball, 10 inch, complete.

3 " " " " " showing interior.

4 " " " " " section.

5 TRAY A.—TUBES FOR GUNS.

a Common quill tube, complete, with four specimens, showing process of manufacture.

b Match, or Fynmore tube, complete, with two specimens, showing process of manufacture.

c Detonating tube, cross-headed, complete, and in section, specimens, showing process of manufacture.

d Quill friction tube, complete, and in section, with ten specimens, showing process of manufacture.

e Copper friction tube, complete, and in section, with ten specimens showing process of manufacture.

f Common brass tube, complete, and in section, with six specimens, showing process of manufacture.

g Galvanic tube, complete, and in section, with five specimens, showing process of manufacture.

h Magnetic tube, complete, and in two sections, with eight specimens, showing process of manufacture.

6 Case shot, 6 pr.

7 " " 9 pr.

8 " " 12 pr.

9 " " 18 pr.

10 " " 24 pr.

11 " " 32 pr.

12 " " 8 inch, or 68 pr.

13 " " 100 pr.

14 " " 150 pr.

15 Round shot, 150 pr.

16 " " 68 pr.

17 " " 56 pr.

18 " " 42 pr.

19 " " 32 pr.

20 " " 24 pr.

21 " " 18 pr.

22 Common shell, Whitworth, 70 pr.

23 Boxer Shrapnel shell, " " complete.

24 " " " " " section.

25 " " " " " 12 pr., complete.

26 " " " " " section.

27 Common shell, Armstrong, 600 pr. M.L.

28 " " " " " 300 pr. M.L.

29 " " " " " 9-22 inch, M.L.

30 Common shell, Armstrong, 7 inch, M.L.

31 " " " " " 64 pr. M.L., complete.

32 " " " " " section, loaded, with E. time fuze and adapter.

33 Segment shell, Armstrong, 64 pr. M.L., complete.

34 " " " " " section, loaded, with Boxer wood time fuze and adapter.

35 Hollow shot, Armstrong, 64 pr. M.L., complete.

36 " " " " " section.

37 Gauges for the above.

38 TRAY B.—METAL FUZES AND BURSTERS.

a Boxer naval time fuze, 7½ seconds, complete.

a 1 " " " " " section, filled.

a 2 " " " " " " empty.

b " " " " " 20 " complete.

b 1 " " " " " " section, filled.

b 2 " " " " " " empty.

c " " " " " Paper cylinder for com- position.

d Armstrong E. time fuze, complete.

d 1 " " " " " in parts.

d 2 " " " " " section, before firing.

d 3 " " " " " after firing.

e Moorsom percussion fuze, complete.

e 1 " " " " " in parts.

e 2 " " " " " section.

f Pillar fuze, complete.

f 1 " " " " " in parts.

f 2 " " " " " section, before firing.

f 3 " " " " " after firing.

g C. percussion fuze, complete.

g 1 " " " " " in parts.

g 2 " " " " " section, before firing.

g 3 " " " " " after firing.

h Boxer percussion fuze for Whitworth shell, complete.

h 1 Boxer percussion fuze for Whitworth shell, in parts.

h 2 Boxer percussion fuze for Whitworth shell, section, before striking.

h 3 Boxer percussion fuze for Whitworth shell, section, after striking.

k Boxer concussion fuze for Whitworth com. shell, complete.

k 1 Boxer concussion fuze for Whitworth com. shell, in parts.

k 2 Boxer concussion fuze for Whitworth com. shell, section, before firing.

k 3 Boxer concussion fuze for Whitworth com. shell, section, after firing.

l Boxer concussion fuze for Whitworth shrap. shell, complete.

l 1 Boxer concussion fuze for Whitworth shrap. shell, in parts.

l 2 Boxer concussion fuze for Whitworth shrap. shell, section, before firing.

l 3 Boxer concussion fuze for Whitworth shrap. shell, section, after firing.

m Pettman percussion fuze, S.S. complete.

m 1 " " " " " in parts.

m 2 " " " " " section, before firing.

m 3 " " " " " after firing.

n " " " " " L.S. complete.

n 1 " " " " " in parts.

n 2 " " " " " section, before firing.

n 3 " " " " " after firing.

o Boring brace for naval time fuze.

p Wrench for naval fuzes.

q Spanner for uncapping naval time fuzes.

r Iron buster for seg. shells, 20 pr. B.L., complete.

r 1 " " " " " " empty.

r 2 " " " " " " sec., filled.

r 3 " " " " " " empty.

s " " " " " 12 pr. B.L., complete.

s 1 " " " " " " empty.

s 2 " " " " " " sec., filled.

s 3 " " " " " " empty.

t " " " " " 9 pr. " complete.

- f 1 Iron burster for seg. shells, 9 pr. B.L. empty.  
 f 2 " " " " " " " sec., filled.  
 f 3 " " " " " " " " empty.  
 v " " " " " " " 6 pr. " complete.  
 v 1 " " " " " " " empty.  
 v 2 " " " " " " " sec. filled.  
 v 3 " " " " " " " " empty.  
 39 Grape shot, Caffin, 68 pr.  
 40 " " " 32 pr.  
 41 " " " 24 pr.  
 42 " " " 18 pr.  
 43 " " " 12 pr.  
 44 " " " 9 pr.  
 45 " " " 6 pr.  
 46 Sections of unleaded segment shells, 40 pr. B.L., 12 pr. B.L., and 6 pr. B.L.  
 47 " " " " " 7 inch B.L.  
 48 Common shell, 7 inch B.L., complete.  
 49 " " " " " section, loaded, with pillar fuze.  
 50 Segment " " " complete.  
 51 " " " " " section, loaded, with time fuze and adapter.  
 52 Common " 64 pr. B.L., complete.  
 53 " " " " " section, loaded, with pillar fuze.  
 54 " " 40 pr. B.L., complete.  
 55 " " " " " section, loaded, with time fuze and adapter.  
 56 Segment " " " complete.  
 57 " " " " " section, loaded, with pillar fuze.  
 58 Common " 20 pr. B.L., complete.  
 59 " " " " " section, loaded, with pillar fuze.  
 60 Segment " 12 pr. B.L., complete.  
 61 " " " " " sec., loaded, with burster and time and concussion fuzes.  
 62 " " 6 pr. B.L., complete.  
 63 " " " " " sec., loaded, with burster and time and concussion fuzes.  
 64 Solid shot, 7 inch B.L.  
 65 " " 64 pr. B.L.  
 66 " " 40 pr. B.L.  
 67 " " 20 pr. B.L.  
 68 " " 12 pr. B.L.  
 69 " " 6 pr. B.L.  
 70 Ring gauges for Armstrong B.L. shells.  
 71 Smoke ball, 13 inch complete.  
 72 Smoke ball, 13 inch, section.  
 73 Congreve rocket, 24 pr., complete, with stick.  
 74 " " 12 pr., " "  
 75 " " 6 pr., " "  
 76 TRAY C.—SECTIONS OF ROCKETS.  
 a Congreve rocket, 24 pr.  
 b " " 12 pr.  
 c " " 6 pr.  
 d " " 3 pr.  
 77 TRAY D.—SIGNAL ROCKET LIGHTS, &c.  
 a Signal rocket, 1 lb., complete.  
 a 1 " " 1 lb., section.  
 b " " ½ lb., complete.  
 b 1 " " ½ lb., section.  
 b 2 " " copper tube for fixing stick.  
 b 3 Paper cone for head of rockets.  
 c Signal light, short, complete.  
 c 1 " " section.  
 d " " long, complete.  
 d 1 " " section.  
 e Cap for signal lights.  
 e 1 Pellet of composition for signal lights.  
 e 2 Handle for signal lights.  
 f Portfire, common, complete.  
 f 1 " " section.  
 g " " percussion, complete.  
 g 1 " " section.

- 78 TRAY G.—SMALL ARM AMMUNITION, &c.  
 a Percussion musket, smooth bore, 4½ drs.,—bullet, cartridge complete, and bundle of ten.  
 a 1 Blank cartridge, 3½ drs. for all arms.  
 b Brunswick rifle, 2½ drs.,—banded ball, five balls with calico patch, cartridge, and bundle of ten.  
 c Rifle musket, pattern '51, 2½ drs.,—bullet, wood plug, cartridge complete, and bundle of ten.  
 d Musket, rifled, pattern '42, 2½ drs.,—bullet, wood plug, cartridge complete, and bundle of ten.  
 e Enfield rifle musket, '53, 2½ drs.,—bullet, wood plug, cartridge complete, and bundle of ten.  
 e 1 Former for making '53 cartridge.  
 e 2 Plug " " " " "  
 e 3 Forming paper, '53 cartridge.  
 f Artillery rifle, 2 drs.,—cartridge complete, and bundle of ten.  
 g Sharp breech-loading carbine, 2½ drs.,—bullet, cartridge complete, and bundle of ten.  
 g 1 Blank cartridge, Sharp, 3 drs.  
 h Terry breech-loading carbine, 2 drs.,—bullet, wood plug, cartridge complete, and bundle of ten.  
 h 1 Blank cartridge, Terry, 3 drs.  
 k Westley Richard's breech-loading carbine, 2½ drs.,—bullet, cartridge complete, and bundle of ten.  
 k 1 Blank cartridge, Westley Richards, 3 drs.  
 m Whitworth rifle, 2½ drs.,—bullet, cartridge complete, empty cylinder for cartridge, and bundle of ten.  
 n Packet of percussion caps, caps complete, sheet copper, and crosses, as cut from sheet.  
 o Punch, die, and film-plate for compressing bullets.  
 79 Caffin small arm filling machine.  
 80 Wooden canteen, complete.  
 81 " " section.  
 82 Barrel, quarter, cartridge, complete.  
 83 " " " " in section, showing small arm ammunition packed.  
 84 Machine for filling cannon cartridges, Captain Caffin's, with four measures.  
 85 Cartridge, flannel, 6 pr., B.L., 12 oz., with Boxer lubricator.  
 86 Cartridge, flannel, 9 pr. B.L., 11b. 2oz., Boxer lubricator.  
 87 " " 12 pr. B.L., 11b. 8oz. " "  
 88 " " 20 pr. B.L., 21b. 8oz. " "  
 89 " " 40 pr. B.L., 61b. " "  
 90 " " 7 inch B.L., 111b. " "  
 91 " " 100 pr., 251b.  
 92 " " 150 pr., 401b.  
 93 " " 600 pr. M.L., 701b.  
 94 " " 6 pr., 1½lb.  
 95 " " 12 pr., 41b.  
 96 " " 32 pr., 101b.  
 97 " " 8 inch, 101b.  
 98 " " 68 pr., 161b.  
 99 Lubricator, 7 inch B.L., whole and in section.  
 100 Paper cylinder for cartridge, 40 pr. B.L.  
 101 Socket for fixing lubricator to cartridge.  
 102 Barrel, whole, powder, common, head removed, machine made.  
 103 Barrel, whole, powder, common, with bung and slide, machine made.  
 104 Barrel, whole, powder, common, with movable lid, machine made.  
 105 Barrel, whole, cartridge, with round lid, machine made.  
 106 Barrel, half, powder, common, machine made.  
 107 Paint keg, large size, " "  
 108 " " small " " "  
 109 Metal case, rectangular.  
 110 " " pentagonal, whole.  
 111 " " half.  
 112 Manby shot, with lights, complete.  
 113 " " " " section.  
 114 Boxer diap. shrap. shell, 6 pr., complete.  
 115 " " " " " sec., loaded, with fuze.  
 116 " " " " " 9 pr., complete.







- 117 Boxer diap shrap. shell, 6 pr., sec., loaded, with fuze.  
 118 " " " " 12 pr., complete.  
 119 " " " " " sec., loaded, with fuze.  
 120 " " " " 18 pr., complete.  
 121 " " " " " sec., loaded, with fuze.  
 122 " " " " 24 pr., complete.  
 123 " " " " " sec., loaded, with fuze.  
 124 " " " " 32 pr., complete.  
 125 " " " " " sec., loaded, with fuze.  
 126 " " " " 8 inch, complete.  
 127 " " " " " sec., loaded, with fuze.  
 128 " " " " 100 pr., complete.  
 129 " " " " " sec., loaded, with fuze.  
 130 " " " " 10 inch, complete.  
 131 " " " " " sec., loaded, with fuze.  
 132 " " " " 150 pr., complete.  
 133 " " " " " sec., loaded, with fuze.  
 134 Ring gauges for diaphragm shell.  
 135 Carcass, 13 inch, complete.  
 136 " " " section.  
 137 " " " gauge.  
 138 TRAY F.—WOOD FUZZES AND IMPLEMENTS.  
 a Boxer mortar fuze, complete.  
 a 1 " " " section.  
 b " " long range fuze, 5½ and 4¾ inch mortar, complete.  
 b 1 Boxer long range fuze, 5½ and 4¾ inch mortar, sec.  
 c " " diaphragm fuze, complete.  
 c 1 " " " section.  
 d " " common fuze, complete.  
 d 1 " " " section.  
 e " " wood time fuze for rifled ordnance, complete.  
 e 1 " " " " " section.  
 f Fuze for Manby shot, complete.  
 f 1 " " " " " section.  
 g Brace and bit for mortar fuze.  
 A Borer, hand, for fuzes, common and diaphragm, complete.  
 k Borer, hook, for fuzes for rifled ordnance, and common and diaphragm, complete.  
 k 1 Six bits for hook borer.  
 k 2 Holder for bits.  
 l 24 pr. rocket fuze, complete.  
 l 1 24 pr. " " " section.  
 m 12 pr. " " " complete.  
 m 1 " " " " " section.  
 n 6 pr. " " " complete.  
 n 1 " " " " " section.  
 o 3 pr. " " " complete.  
 o 1 " " " " " section.  
 p Hand grenade, fuze, complete.  
 p 1 " " " " " section.  
 139 Mortar shell, 13 inch, complete.  
 140 " " " " " section, loaded with Boxer mortar fuze.  
 141 Mortar shell, 13 inch, gauge.  
 142 Naval shell, 150 pr., complete.  
 143 " " " " " sec., loaded, with Pettman fuze.  
 144 " " " " 100 pr., complete.  
 145 " " " " " section, loaded, with 7½ secs. time fuze.  
 146 Naval shell, 8 inch, complete.  
 147 " " " " " sec., loaded, with Moorsom fuze.  
 148 Ring gauges for naval shell.  
 149 Com. shell, 42 pr., complete.  
 150 " " " " " sec., loaded, with Boxer com. fuze.  
 151 " " " " 32 pr., complete.  
 152 " " " " " sec., loaded, with Pettman fuze.  
 153 " " " " 24 pr., complete.  
 154 " " " " " sec., loaded, with Pettman fuze.  
 155 " " " " 18 pr., complete.  
 156 " " " " " sec., loaded, with Boxer com. fuze.  
 157 " " " " 12 pr., complete.  
 158 " " " " " sec., loaded, with Boxer com. fuze.  
 159 Ring gauges for common shell.  
 160 Martin shell, 10 inch, complete.  
 161 " " " " " section, representing molten iron.

D. *From the Royal Small Arm Factories, Enfield*, Colonel W. M. Dixon, R.A., Superintendent.—Cases of small arms, complete, and in different stages of manufacture; armourer's forge.

E. *From the Military Store Department, Woolwich*.—Captain H. W. Gordon, C.B., principal Military Storekeeper.—Saddle-trees.

221 THE SECRETARY OF STATE FOR WAR, *from the Ordnance Survey Department*, Colonel Sir Henry James, R.E., F.R.S., director:—

F. Portion of the Ordnance map of the county Dublin, on the scale of six inches to a mile.

G. Specimen of hill engraving on the portion of the general map of Ireland—one inch to a mile—embracing Dublin and the adjacent county.

H. Portion of the Ordnance map of city of Dublin, on the scale of five feet to a mile.

I. Specimen of hill engraving on the general map of Ireland, embracing Belfast and its environs.

J. Engravings in trio-tinto, by Mr. James Duncan, principal engraver, Ordnance Survey Office, Dublin.

K. Outline map, on one inch scale, of Belfast and its environs.

Specimens of Electrotyping:

L. A copperplate of the town of Belfast and suburbs, on a scale of six inches to a mile, and an impression.

M. An electro matrix of the same.

N. Facsimiles of national manuscripts, reproduced by photo-zincography.

#### NAMES OF JURORS.

Major-General HON. A. GORDON, C.B., Dublin.

Colonel BUCHANAN, R.A., Commanding R.A. in Ireland, Dublin.

Captain WALKER, Commander U.S.S. "Sacramento," United States.

Captain WILLCOX, R.N., Pilot Master to the Port of Dublin, Kingstown.

#### LIST OF AWARDS.

##### MEDAL.

#### UNITED KINGDOM.

200 CLIFFORD, C. 3 East India avenue, Leadenhall st. London, E.C.—For a most useful invention for lowering boats.

202 GIBBONE, F. N. 445 West Strand, London, W.C.—For a most useful invention of patent electric signals.

204 NUNN, W. 179 St. George st. East, London, E.—For a most useful invention of patent ship and boat lights; for Commander Colomb's patent flashing day and night signal apparatus; and for Lieut. Key's patent fog horn.\*

206 SCALLAN, M. Ringsend, Dublin.—For a most useful invention for removing keelsons without taking out mast or disturbing rigging.

207 WALPOLE, WEBB, & BEWLEY, Port of Dublin Yard, North Wall, Dublin.—For excellence of workmanship in their model of steamer, "Anna Liffey."

208 WARNOCK, W. H. 33 Queen's sq. Dublin.—For excellence of workmanship in a model of a ship on his own lines.

209 LAIRD, BROTHERS, Birkenhead.—For excellence of workmanship in their model of the mail steamer "Connaught."

\* The rule laid down by the Executive Committee—"Medals will be awarded only to Exhibitors"—precludes the Jury from conferring that distinction on Commander Colomb and Lieutenant Key.

**876 PENINSULAR & ORIENTAL STEAM NAVIGATION Co.** 132 *Leadenhall st. London, E.C.*—For excellence of workmanship in model of steam ship "Golconda."

**199 MILLWALL IRONWORKS AND SHIPBUILDING Co.** *George yard, Lombard st. London, E.C.*—For excellence of workmanship in model of H.M.S. "Northumberland."

**878 WOOD, J. W.** *Harwich, Essex.*—For new invention of life raft.

**214 SMITH, J.** *Rifle Works, Loveday st. Birmingham.*—For his own invention of self-locking breech-loader; and HONOURABLE MENTION for good workmanship.

**216 TRULOCK, BROTHERS,** 11 *Essex quay, Dublin.*—For their own invention of breech-loading gun; and HONOURABLE MENTION for their new invention of lock-fastener.

**217 RIGBY, W. & J.** *Suffolk st. Dublin.*—For needle rifle, and best match rifle, their own inventions; and HONOURABLE MENTION for their new invention of self half-cocking action.

**220 THE SECRETARY OF STATE FOR WAR:—**

A. *The Royal Gun Factory, Woolwich.*—For collection of rifled and smooth-bore guns.

B. *The Royal Carriage Department, Woolwich.*—For collection of gun-carriages and traversing platforms.

C. *The Royal Laboratories, Woolwich.*—For case of war material.

D. *The Royal Small Arm Factories, Enfield.*—For cases of small arms.

E. *The Military Store Department, Woolwich.*—For collection of saddle-trees.

#### INDIA.

The Jurors desire to direct special attention to the interesting and valuable COLLECTION OF ARMS OF INDIAN MANUFACTURE, FROM THE ROYAL COLLECTION AT WINDSOR CASTLE, EXHIBITED BY PERMISSION OF HER MAJESTY THE QUEEN.

#### NOVA SCOTIA.

**59 ROBINSON, A.**—For a new and improved plan of fitting top-sail clew, and patent thimbles.

#### BELGIUM.

**73 BAYET, BROTHERS,** *Liège.*—For excellence of workmanship in their breech-loaders and revolvers.

**75 DUMOULIN-LAMBINON,** *Liège.*—For excellence of workmanship of horizontal-action breech-loader.

**76 JANSSEN, A., Brussels.**—For good manufacture finish, and cheapness of his breech-loaders.

#### ROME.

**12 TONI, TOMMASO.**—For his new invention of breech-loader convertible into muzzle-loader.

#### UNITED STATES.

**WARD, W. H.** *New York.*—For his new inventions of signals, improved lantern, steering lantern and machine for making bullets.

#### HONOURABLE MENTION.

#### UNITED KINGDOM.

**201 CONLAN, W. J.** *Dalton villa, Merton road, Liverpool.*—For good workmanship in his model of schooner.

**210 BAKER, F. T.** 88 *Fleet st. London, E.C.*—For good workmanship in his breech-loaders and rifles.

**211 GREENER, W. W.** *St. Mary's Works, Birmingham.*—For good workmanship in his breech-loaders and rifles.

**212 KAVANAGH, W. & J.** 12 *Dame st. Dublin.*—For good workmanship in their breech-loaders and rifles.

**213 McCALLUM, D.** *Octagon, Plymouth.*—For his new invention of patent distance indicator.

**215 THOMSON, A. & SON,** 16 *Union place, Edinburgh.*—For good workmanship in their breech-loaders.

**218 TRULOCK & HARRIS,** *Dawson st. Dublin.*—For good workmanship in their rifles.

**219 RICHARDSON & SONS,** *Cork.*—For good workmanship in their rifles and sporting guns.

**877 SIMONS, W. & Co.** *London Works, Renfrew.*—For good workmanship in their models of steam ships and dredging barges.

#### BELGIUM.

**74 DITS, A. J.** *St. Gilles, near Brussels.*—For good manufacture in his cartridges.

#### FRANCE.

**38 TRONCHON, A. P.** *Paris.*—For ingenuity of invention in his 12-shot gun.

#### ZOLLVEREIN.

**47 HOESTERBY, J. P.** *Barmen, R.P.*—For good manufacture in his percussion caps.

## SECTION IX.—AGRICULTURAL AND HORTICULTURAL MACHINES AND IMPLEMENTS.

Exhibited on the Premises of the Royal Dublin Society, Kildare-street.

The committee having no room for this collection of implements, &c., in the Exhibition building, secured the Dublin Society's premises in Kildare-street, with free admission to the public, more than 50,000 of whom visited the collection. The zealous and obliging superintendent, Mr. Corrigan, early issued the following circular:—

Dublin International Exhibition, 1865.

Machinery Department, Section 9.

Royal Dublin Society's Agricultural Hall.

SIR,—I beg to direct your attention to the accompanying circular, by which you will observe that the Royal Dublin Society have granted the use of their extensive premises for the display of agricultural implements and machines in connexion with the above Exhibition. The premises are admirably suited for the purpose, being centrally situated, and being long the theatre of

every exhibition held hitherto in Ireland since 1840. The halls assigned to the present purpose contain over 45,000 square feet, and in addition to the accommodation afforded to agricultural implements, &c., the spacious galleries accommodate many industries, viz.:—Manufactures from wool, linen, clay, wood, minerals; and culinary and domestic utensils are very creditably represented, and the Executive Committee have, in the most handsome manner, opened this department free to visitors; it forms a most useful and highly important annexe to the Exhibition, and is only separated from the Palace building by Stephen's-green and a portion of the street in which it is situated, a plan of which has been considerably inserted in the official catalogue for the guidance of visitors.

ANDREW CORRIGAN, Superintendent.

There were many firms represented here in a highly

creditable manner—firms long identified with local exhibitions and national displays of industry. Amongst these we may name Messrs. R. Garrett and Son, Lelston Works, Saxmundham, Suffolk; Messrs. Greene and Sons, Smithfield Iron Works, Leeds; Messrs. Sheridan, with a highly creditable collection of Irish manufactured and admirably finished implements from their works, Bridgefoot-street, Dublin; the Messrs. M'Kenzie, Munster House, Camden quay, Cork; this firm contributed a collection alike creditable to the producers and the exhibition, and displayed upon their stand the prize challenge cup given by the Messrs. Purdon, proprietors of the *Farmer's Gazette*, and won on three several occasions by Messrs. M'Kenzie.

The firm of Messrs. Roby and Co., of Bury St. Edmunds, had a collection of highly finished grain separators, and the patent prize hay-maker, to which the Royal Dublin Society's prize medal was awarded at the last Spring show, was amongst the selections shown here. The grain separators we conceive to be machines of special value to Ireland in the production for market of superior grain, a desideratum alike beneficial to the vendor and purchaser. We recollect once having heard a statement that a loss upon grain sent from Ireland into Mark-lane, London, amounted to a sum equal to the entire valuation. We noticed with considerable satisfaction the practically useful collection of substantially finished implements exhibited by Messrs. W. and J. Ritchie, Ardee, whose names are familiar with the public as a first-class Irish firm, and we recollect having, in 1865, had the pleasure to record the spirit and enterprise of that firm, by sending similar collections to the Paris International Exhibition. Messrs. Kennan, the well-known Irish manufacturers, made a most creditable display here. This firm enters the lists and competes successfully at the great English shows. Robey and Co., of the Perseverance Iron Works, Lincoln, sent a splendidly finished portable eight-horse engine and threshing machine, and a most economical saw table of an improved kind. The engine was awarded a first-class medal at the late London Exhibition. Messrs. Ashby and Jeffries, of Rutland-terrace Iron Works, Stamford, exhibited a highly creditable collection, amongst which the prize and highly valuable implements to Ireland, the double-action hay-tedder and patent prize steel tooth horse-rake, &c., were shown. This is an old and respectable firm, long associated with Irish shows, both in the metropolis and the provinces of this country. The Phospho-Guano Company, Liverpool, contributed an extensive collection of phospho-guano—a manure of special value, and one which is in great demand and fast taking the place of the Peruvian guano. Mr. Reid, of Aberdeen, had in the central hall a collection of useful and economical drill-sowing machines.

Mr. James Sheridan, of the Eagle Foundry, Dublin, though exhibiting largely in the Exhibition Building, was also a large exhibitor in this department. His stand comprised a most creditable and varied collection of goods, all of native manufacture, amongst which may be mentioned machines for flax breaking and scutching, and applicable to either steam, water, or horse power; handsome entrance gates and piers; improved windows suited for labourers' dwellings, farmsteads, out-offices, &c.; some large and beautifully finished pedestals and vases for lawns, pleasure grounds, &c. A flax scutching machine, very simple in construction, occupying a space of but six feet in width, which may consist of any number of stocks as required. It was mounted on metal framing, with cast iron benches, and will scutch on an average eight stone of flax per day per stock.

The collections of tiles exhibited by the Earl of Enniskillen, from the Florence Tile Works, near Enniskillen, were of very superior excellence. The garden flower pots appeared to be of a shape and quality that evidenced there is an article made here quite equal to the home demand. Messrs. Hornsby,

of Spittlegate Iron Works, Grantham, exhibited a collection of excellent machines. Messrs. Paul and Vincent, Blackhall place, showed many useful implements and collections of artificial manures. Messrs. Greene and Thomas, of Bishopsgate-street and Luton, exhibited the finest stands of kitchen ranges, baths, and culinary utensils, that we have ever seen hitherto shown. One of those splendid ranges was awarded the first prize medal at the London International Exhibition. Their close fire range, to prevent the odours arising from cooking being diffused, is an article of special value. Messrs. Morton, of Liverpool, show various sketches in a fixed state of their splendid wires and gate crossings. Messrs. Edmundson, of Capel-street, Dublin, displayed on their extensive stands many highly useful inventions, viz., improved horse boxes, gas apparatus, mangles, churns, safes, &c., &c. Mr. M'Sherry, of Limerick, showed an iron manufactured range of creditable workmanship; and so did the Messrs. Hedges, of Dublin. The Messrs. Hill and Smith, of Brierly Hill Iron Works, Staffordshire, had a collection of most useful inventions in wire fencing, field and ornamental gates, &c.

Messrs. Smith and Wellstood, of Capel-street, Dublin, and Glasgow, exhibited a large collection of most useful steaming apparatus, suited for agricultural purposes, in the economy of which there is considerable merit. They form part of a more extensive collection shown in the Palace Building.

222 KEMP, MURRAY & NICHOLSON, *Stirling, N.B.*—Mowing machines, drills, &c.

223 BOBY, R. *St. Andrew's Works, Bury St. Edmunds, Suffolk.*—Beard's new patent glass-house; patent corn screening and dressing machine; self-cleaning corn screens; barley hummeller; hay-making machine.

224 BRADFORD, T. *Manchester, Fleet st. London, and 23 Dawson st. Dublin.*—Patent washing, wringing, and mangling machines; patent, butter making, cleaning, and salting machine; patent churn.

225 WOOD, W. A. *77 Upper Thames st. London.*—London prize patent one-horse reaping machine.

226 HAYTHORNE, J. W. *20 Clumber st. Nottingham.*—Hexagon garden nets, Chiswick garden net, for protecting trees, shading vinerias, &c.

227 DUFFIELD, J. *12 Great Chapel st. Oxford st. W. London.*—Churns, butter prints, moulds, tablets: dairy and culinary utensils.

228 ENNISKILLEN, EARL OF, *Florencecourt, Enniskillen.*—Draining pipes; flooring tiles; flower pots.

229 EDMUNDSON, J. & Co. *Capel st. Dublin.*—Patent stable fittings; patent gas apparatus; patent washing machinery.

230 EGAN, P. *16 Webber st. Lambeth, London.*—Self-acting ventilator.

231 GOUCHER, J. *Church Walk Iron Works, Worksop, Nottingham.*—Sets of six patent beater plates for thrashing corn; patent drum.

232 GREENSLADE, E. A. & W. *Thomas st. Bristol.*—Smith's or forge bellows.

233 IRWIN, A. *Baltimore, Boyle, co. Roscommon.*—Black oats grown upon reclaimed moor bog in 1864.

234 KENDALL, J. *Lincoln's Inn, London, and Derryginla, Clifden, Connemara.*—Shell sand (lime) from coast of Connemara.

235 RICHES & WATTS, *Duke's Palace Iron Works, Norwich, England.*—Patent self-sharpening portable American grist mill.

236 M'FARLANE, W. *39 Stockwell st. Glasgow.*—Mangles for table linens, &c.

237 ROBE, W., *58 Grass market, Edinburgh.*—Cart harness.

237 JENSEN, BROTHERS, *Fauborg, Denmark.*—Chaff cutting machines.

238 MESSENGER, T. G. *Loughborough, Leicestershire.*—Patent triangular tubular boiler for heating buildings with hot water; patent double and single valves for hot or cold water, or gas.

**239 NAGLE, E. P. 6 Lower Dominick st. Dublin.**—Ground plan and isometrical elevation of a farmery for a farm of 300 acres; also a farmery for a farm of 20 acres.

**240 NORMAN, R. & N. St. John's Common, Burgess Hill, Hurstperpoint, Sussex.**—Plain and ornamental bricks, &c.; ridging and other tiles.

**241 BROWN, R. Paisley, Scotland, and 56 North wall quay, Dublin.**—Glazed sewer pipes; plain and ornamental chimney cans; garden vases and pedestals; cattle feeding troughs; field drainage pipes, &c.

**242 REED, B. & Co. Union st. Aberdeen, N.B.**—Corn drills.

**243 RAWLINGS, J. & J. S. Moor End Iron Works, Melbourn, Royston, Cambridgeshire.**—Improved horse rake for cleaning and gathering all kinds of grain crops.

**244 RIDDEL & Co. Donegal place and Pountain st. Belfast.**—Patent iron fittings for cow houses, stables, and loose boxes; vitrified pavement; improved halter, &c.

**245 ROWSELL, S. Buckland St. Mary, near Chard, Somerset.**—Entrance gate of English oak and wrought iron.

**246 SHERIDAN, J. 162 Church st. Dublin.**—Flax breaking machine; flax scutching machine; stable fittings for stalls and loose boxes.

**247 THOMAS, F. 72-74 Bishopsgate st. Within, London.**—Steaming apparatus for roots, &c.; kitchen ranges for working ditto.

**248 TOMLINSON & HAYWARD, Lincoln.**—Tin cases of Simpson's cattle spice; Tomlinson and Co.'s Lincoln butter powder.

**249 UNDERHILL, W. 8. Newport, Salop.**—Portable steam engine; patent finishing thrashing machine, with Underhill's patent elevator; wrought iron cultivator; farming implements; Bruckshaw's cheese press; fences.

**250 WALSH, J. Stedalt, Balbriggan.**—Double and single furze crushers.

**251 WALTON, N. & Co. City Saw Mills, Worcester.**—Washing, wringing, drying, and mangling machines.

**252 JACK & SON, Maybole, Ayrshire, N.B.**—Hussey reaping machine; "Buck eye," combined reaper and mower; barrel rollers; sowing grubbers, &c.

**253 WOOD, W. A. 77 Upper Thames st. London, E.C.**—Improved mowing machine and reaping machine.

**254 O'SHEE, P. Gardenmorris, Kilmachomas, co. Waterford.**—Vases, fancy ridge tiles, and bricks, pressed bricks, tiles, &c.

**255 M'KENZIE, T. & SONS, Pine st. Iron Works, Cork.**—Agricultural implements.

**256 MILBURN, J. Albion Foundry, Hollingworth, near Hadfield, Manchester.**—Lawn mowing, rolling, and collecting machine.

**257 GABRETT, B. & SONS, Leiston Works, Suffolk.**—Portable steam engine.

**258 HORNBRY, R. & Co. Grantham.**—Ploughs, chaff cutters, &c.

**259 ROBEY & Co. Lincoln.**—Steam engine; thresh-machine; circular saw.

**260 HARPER & MOORE, Lower Delft Fire Clay Works, Stourbridge.**—Specimens of Stourbridge fire clays for the manufacture of glass, house pots, and furnaces; crucibles, fire clay retorts, and furnaces, cupolas, &c.

**261 WALTON, N. & Co. City Saw Mills, Worcester.**—Washing, drying, and mangling machines.

**262 KELLY, J., C. E. Brook Lodge, Roscommon.**—Glass churn; stone, metal, and wooden churns; washing machine; flax brake; flax scutcher; machinery for manufacturing, and samples of peat fuel; turnip cutter.

**263 MITCHELL, J. J. Dublin.**—Patent flax scutching machine.

**264 PAUL & VINCENT, Blackhall place, Dublin.**—Liquid manure cart.

**265 BEERY, E. JUN. Herstonceux, Sussex, England.**—Garden baskets, &c.

**266 MESSENGER, T. G. Loughborough, Leicestershire.**—Conservatory.—(In Exhibition Palace Garden.)

**267 HANCOCK, J. & P. Plough Works, Tipton, Staffordshire.**—Hancock's patent pulverizer plough; butter machines.

**268 NATHAN, G. 13 Synnot place, Dublin.**—Box churns; cinder sifters; linen pressers; cork pressers.

**269 MORTON, F. & Co. Naylor st. Liverpool.**—Patent strained cable wire fencing.

**270 LAVENDER, C. 66½ Grafton st.**—Vases, pedestals, stands, windguards, chimney cans, pipes, bricks, blocks, tiles, &c.

**271 CRANSTON.**—Conservatory.—(In Exhibition Palace Garden.)

**272 TYRRELL, J. Hammond lane.**—Cart and carriage axles, farming implements; tools; smiths' fittings.

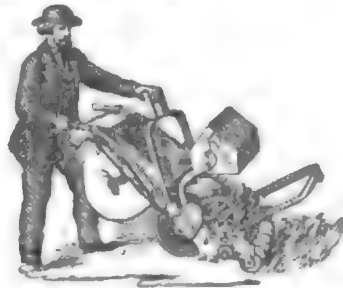
**273 DENNIS, T. H. P. Chelmsford, Essex.**—Patent ornamental conservatory; sun blind and frost protector; vineries; sashes and casements; conservatory engine; hand lights, &c.—(In Exhibition Palace Garden.)

**274 KENNAN & SONS, 18 and 19 Fishamble st. Dublin.**—Inventors and manufacturers.



**PRIZE MEDAL AWARDED** for collection, including lawn mowers, iron wire fences and gates.

Everything exhibited was entirely made at their own works in their ordinary style.



Kennan's registered and prize medal lawn mower, with tilt action.

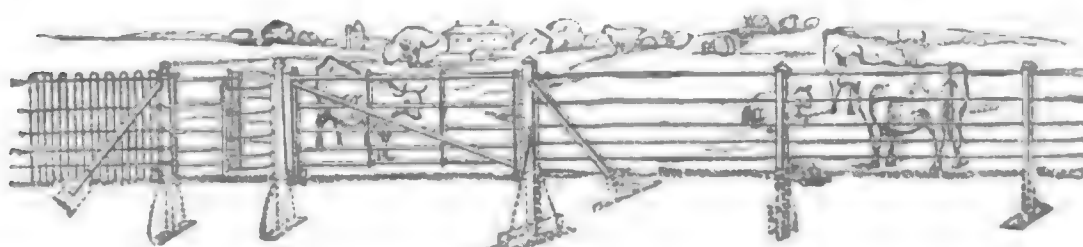
Awarded prize medal at International Exhibition, London, 1862, and Limerick Show, 1862.

Special commendation Royal Horticultural Society, London:—"These machines fulfil every requirement in the simplest manner."

THE TILT ACTION DELIVERY is strongly recommended; its practical value has overcome the prejudices with which some received it at first; for donkey or horse-power machines it is indispensable. The machine is provided with two boxes, one in front and one behind between the handles. The grass is caught in the smaller contrivance lifted and its contents deposited in the hinder box. The latter can be emptied by turning it over, leaving the grass in large heaps, or it may be lifted off and at once emptied into a barrow or cart. In this way the stoppages to get rid of the grass are avoided. The back box gives so nice a balance that large machines can be turned round as readily as small ones.

The Gearing is simple, durable, and makes very little noise, less than some called noiseless. The drum clutches have hardened faces. The cutters may be set to mow at any required height by a simple adjustment; the driving power is very light. Every part of these machines is carefully designed so as to combine strength, lightness, and simplicity.

KENNAN'S WIRE FENCES are manufactured on the system invented and legally protected by K. & Sons. It has been pronounced the greatest improvement ever



Kennan's Wire Fences.

made in wire fences. They are *neat, economical, and durable*. They have been thoroughly tested, and their value proved in all parts of Ireland. The straining posts and standards have self-fixing feet, and do not require any stone blocks; the wires are kept constantly tight by the tangential winders.

K. and Sons have published an enlarged catalogue of wire fences, with full particulars of the construction and price of the several varieties. They will be happy to send a copy to any gentleman requiring such work.

Estimates of the total cost of supplying and erecting any piece of fence can be given by K. and Sons on receiving a sketch of the ground line, with the measurements.

**275 SHANKS, A. & SON, Dens Iron Works, Arbroath, N.B., and 27 Leadenhall st. London.**—Stationary steam engine and boiler; lawn mowing, rolling, collecting, and delivering machines.

**276 CASEY, J. 41 Cook st. Dublin.**—Patent fire escape.

**277 BIDDLE & MATHIAS, 8 Talbot st. Dublin.**—Patent nails, &c.

**278 MAQUIRE & SON, 18 Dawson st. Dublin.**—Stable fittings; garden seats, &c.

**279 SMITH & TROG, 47 Great College st. Camden town, London, N.W.**—Agricultural brands; scythe sharpeners.

**280 EDMONDSON, BROTHERS, 10 Dame st. Dublin.**—Bees working in glass.—(Under West Verandah of the Apac, Exhibition Palace Garden.)

**281 GREEN, T. SON, & CO. Smithfield Iron Works, Leeds, Yorkshire.**—Lawn mowing machines, garden rollers, vases, fountains, seats, and implements.

**282 BARROWS & CARMICHAEL, Banbury.**—Steam engine and threshing machine.

**283 BAKER, J. Wisbeach, Cambridgeshire.**—Patent corn dressing machines.

**284 MACKAY, J. W. 40 Westmoreland st.**—Agricultural seeds, manures, &c.

**285 NOBLE, J. Chapelizod, Dublin.**—Chaff cutters; mowing and reaping machines.

**286 DANIEL, W. 55 Mary st. Dublin.**—Apparatus for the manufacture of gas.

**287 SHAW, H. 92 Talbot st. Dublin.**—Rock salt, manufactured salt, &c.

**288 BRIGHAM & BICKERSON, Berwick-on-Tweed.**—Patent Buckeye reaping and mowing machine.

**289 SILVESTER, J. Sheffield st. Lincoln's-Inn fields, London.**—Cow-milking apparatus; wringing machine.

**881 BRACCIO, PIETRO, Valeggio, Italy.**—A plough.

**882 DELSTANCHE, P. H. Brabant, Belgium.**—Corn winnowing machine; weighing machine; safe; files.

**883 COLVEN, G. 34 Dorset st. Dublin.**—Flower boxes.

**884 RITCHIE, W. & J. Ardee.**—Ploughs, &c.

**885 FRY, A. & J. Bristol.**—American horse-rakes; grass-seed sowers.

**886 SHERIDAN, H. & CO. Bridgefoot st. Dublin.**—Ploughs, hay-rakes, &c.

**887 ROGER & CO.**—Millstones.

**888 HILL & SMITH, Dudley.**—Iron fencing, gates.

**889 DASSONVILLE, ST. HUBERT DE, Namur, Belgium.**—Millstones.

**890 ASHBY & JEFFERY, Stamford.**—Hay-making machine; steel-tooth horse rake.

**891 CLARK & SON, Brackley, Northamptonshire.**—Patent scythes.

RETURN OF THE NUMBER OF VISITORS TO THE AGRICULTURAL DEPARTMENT (SECTION IX.), HELD ON THE DUBLIN SOCIETY'S PREMISES, KILDARE-STREET.

Date	Number Visitors	Date	Number Visitors
1865		1865	
18th May,	197	Over,	16,201
19th "	232	14th July,	440
20th "	163	15th "	239
22nd "	291	17th "	439
23rd "	277	18th "	264
24th "	294	19th "	397
25th "	330	20th "	328
26th "	295	21st "	358
27th "	315	22nd "	309
29th "	233	24th "	466
30th "	264	25th "	343
31st "	274	26th "	481
1st June,	235	27th "	420
2nd "	265	28th "	418
3rd "	298	29th "	333
5th "	394	31st "	413
6th "	393	1st August,	450
7th "	386	2nd "	384
8th "	324	3rd "	473
9th "	425	4th "	421
10th "	373	5th "	394
12th "	403	7th "	407
13th "	543	8th "	360
14th "	386	9th "	309
15th "	481	10th "	311
16th "	416	11th "	346
17th "	347	12th "	234
19th "	325	14th "	363
20th "	347	15th "	497
21st "	396	16th "	346
22nd "	329	17th "	380
23rd "	304	18th "	391
24th "	339	19th "	304
26th "	364	21st "	360
27th "	330	22nd "	363
28th "	397	23rd "	322
29th "	412	24th "	342
30th "	367	25th "	313
1st July,	320	26th "	390
3rd "	384	28th "	340
4th "	277	29th "	310
5th "	358	30th "	376
6th "	213	31st "	373
7th "	341	1st Sept.,	390
8th "	200	2nd "	310
10th "	421	4th "	360
11th "	386	5th "	304
12th "	385	6th "	293
13th "	342	7th "	387
Carried over,	16,201	Carried over,	34,797

## RETURN OF THE NUMBER OF VISITORS TO THE AGRICULTURAL DEPARTMENT—Continued.

Date	Number Visitors	Date	Number Visitors
1865 Over, 34,797		1865 Over, 42,881	
8th Sept., 273		9th Oct., 354	
9th " 299		10th " 281	
11th " 380		11th " 278	
12th " 346		12th " 160	
13th " 265		13th " 297	
14th " 364		14th " 277	
15th " 309		16th " 284	
16th " 270		17th " 330	
18th " 341		18th " 334	
19th " 287		19th " 285	
20th " 307		20th " 340	
21st " 299		21st " 280	
22nd " 321		23rd " 275	
23rd " 368		24th " 263	
25th " 352		25th " 290	
26th " 352		26th " 304	
27th " 426		27th " 363	
28th " 427		28th " 265	
29th " 318		30th " 240	
30th " 252		31st " 285	
2nd Oct., 320		1st Nov., 488	
3rd " 160		2nd " 254	
4th " 265		3rd " 315	
5th " 248		4th " 216	
6th " 304		5th " 225	
7th " 231			

Carried forward, 42,881

TOTAL, 50,179

ANDREW CORRIGAN,  
Superintendent.

6th Nov., 1865.

The members of the Jury (for Class B) to whom this section was assigned were:—

Lord CLONCURRY,	Dublin.
Viscount DUNLO,	"
Sir RICHARD GRIFFITH, Bart.,	"
PHINEAS RIAL, Esq., J.P.,	Bray.
C. O. VESSEY, Esq., J.P.,	"
ROBERT COLLINS, Esq., M.D.,	Navan.
Captain J. B. THORNHILL, Secretary to Royal Agricultural Society,	Dublin.
DAVID DRUMMOND, Esq.,	"
GEORGE WOOD MAUNSELL, Esq., J.P.,	"
J. BORTHWICK, Esq., J.P.,	Carrickfergus.
CH. U. TOWNSEND, Esq., Land Agent,	Dublin.
TH. C. TRENCH, Esq., J.P.,	Dublin.
R. O. WADE, Esq.,	Dublin.
PARK NEVILLE, Esq., C.E.,	"
WILLIAM EDWARD STEELE, Esq., M.D.,	"

## REPORT OF JURY.

THE Jurors of Section IX. have much pleasure in handing in a list of their awards, in stating how much they were pleased with the character and style of the implements submitted to them for inspection, and how much they were gratified to find many of their Irish friends fully equal to hold their own with the best manufacturing firms of agricultural implements elsewhere.

The principle on which your Jurors acted was to award a medal or a commendation to any collection or single implement they thought worthy of remark; but they must beg it may be fully understood, that in making their awards they do not intend in any way to mark the comparative merits of the implements of different makers, or that their inspection and examination is to be looked upon in any way as competition.

With these few remarks your Jurors beg to forward a list of their awards, taking the numbers *seriatim* as

they appear in the Catalogue, and appending a few names of Exhibitors to whom medals or commendations have been awarded, but whose names were not inserted in the Catalogues furnished to the Jurors.

## LIST OF AWARDS.

## MEDAL.

## UNITED KINGDOM.

223 BOBY, R. *St. Andrew's Works, Bury St. Edmunds, Suffolk.*—For his corn dressing machines and barley hummeller; and HONOURABLE MENTION for hay tedder.

224 BRADFORD, T. *Manchester, Fleet st. London, and 23 Dawson st. Dublin.*—For his washing machine.

249 UNDERHILL, W. S. *Newport, Salop.*—For his fences and patent elevator.

250 WALSH, J. *Stedalt, Balbriggan.*—For his furze crushers.

252 JACK & SON, *Maybole, Ayrshire, N.B.*—For their collection of agricultural implements.

253 WOOD, W. A. *77 Upper Thames st. London, E.C.*—For his mowing and reaping machines.

255 M'KENZIE, T. & SONS, *Pine st. Iron Works, Cork.*—For their collection of agricultural implements and machines; with HONOURABLE MENTION for cleaner.

257 GARRETT, R. & SONS, *Leiston Works, Suffolk.*—For their steam engine and corn drill.

264 PAUL & VINCENT, *Blackhall place, Dublin.*—For their collection of agricultural implements.

267 HANCOCK, J. & P. *Plough Works, Tipton, Staffordshire.*—For their butter making machines.

269 MORTON, F. & Co. *Naylor st. Liverpool.*—For their wire fencing.

272 TYRRELL, J. *Hammond lane, Dublin.*—For his collection of draining tools.

273 DENNIS, T. H. P. *Chelmsford, Essex.*—For the application of wrought iron to conservatories, &c.

281 GREEN, T. SON, & Co. *Smithfield Iron Works, Leeds, Yorkshire.*—For their lawn mower and vertical steam engine; and HONOURABLE MENTION for garden rollers.

283 BAKER, J. *Wisbeach, Cambridgeshire.*—For his corn dressing machine.

284 MACKAY, J. W. *40 Westmoreland st. Dublin.*—For his collection of seeds.

223 KEMP, MURRAY & NICHOLSON, *Stirling.*—For their collection of agricultural implements and machines.

259 ROBY & Co. *Lincoln.*—For their steam engine.

258 HORNSBY & SONS, *Grantham.*—For their collection of agricultural machines.

888 HILL & SMITH, *Brierly Hill Iron Works, near Dudley.*—For their wire fencing and gates.

172 BISSELL, W. *Wolverhampton.*—For morticing machine.

891 CLARKE & SON, *Brailley, Northamptonshire.*—For their scythes.

890 ASHBY & JEFFERY, *Stamford.*—For their hay-making machine and rake.

## CANADA.

16 WHITING, A. S. *Oatland.*—For excellence of manufacture and moderate price of collection of scythes, hay-forks, and drags.

27 SIBLEY, P. *Sherbrooke, E.C.*—For excellence of manufacture and moderate price of scythes.

## BELGIUM.

77 BERCKMANS, J. F. *Blaesvelt, near Mechlin.*—For his improved plough.

70 DELSTANCHE, P. *Marbais.*—For collection of agricultural machines.

81 LECOMTE, P. J. *Pont-à-Celles.*—For his iron plough with double mould board.

82 WOUTERS, J. F. *Nirelles*.—For his collection of agricultural machines.

87 VANDEN-HEUDE, R. *Stenhuyzen Wynhuizen, near Alost*.—For excellence of manufacture and moderate price of cattle probangs.

#### DENMARK.

2 JENREK, BROS. *Faaborg*.—For their chaff-cutting machines.

#### FRANCE.

39 METZOUNIAL, BROS. *Sarlat (Dordogne)*.—For ingenuity and economy in their boiler for farms, armies, &c.

#### HONOURABLE MENTION.

##### UNITED KINGDOM.

228 ENNISKILLEN, EARL OF, *Florencecourt, Enniskillen*.—For his drainage tiles.

229 EDMUNDSON, J. & Co. *Capel st. Dublin*.—For their stable fittings.

230 EGAN, P. 16 *Webber st. Lambeth, London*.—For self-acting ventilator.

231 GOUCHER, J. *Church Walk Iron Works, Workshop, Nottingham*.—For his patent beater plates for thrashing corn.

236 McFARLANE, W. 39 *Stockwell st. Glasgow*.—For his mangles.

238 MESSENGER, T. G. *Loughborough, Leicestershire*.—For his patent double and single valves, and for his conservatory.

240 NORMAN, R. & N. *St. John's Common, Burgess Hill, Hurstperpoint, Sussex*.—For their bricks and tiles.

241 BROWN, R. *Paisley, Scotland, and 56 North wall quay, Dublin*.—For his cattle feeding troughs, tiles, &c.

242 REED, B. & Co. *Union st. Aberdeen, N.B.*—For good manufacture and cheapness of their corn drills.

245 ROWSELL, S. *Buckland St. Mary, near Chard, Somerset*.—For farm and other gates.

247 THOMAS, F. 72-74 *Bishopsgate st. Within, London*.—For his steaming apparatus, applicable to work-houses.

261 WALTON, N. & Co. *City Saw Mills, Worcester*.—For their clothes drying machine.

270 LAVENDER, C. 66½ *Grafton st. Dublin*.—For his collection of vases, pipes, draining cans, bricks, tiles, &c.

277 BIDDLE & MATHIAS, S. *Talbot st. Dublin*.—For their patent nails.

386 SHERIDAN, H. & Co. *Bridgefoot st. Dublin*.—For their churns and horse gear.

226 HAYTHORNE, J. W. 14 *Chamber st. Nottingham*.—For garden nets.

#### BELGIUM.

80 LEBGUEF, F. *Bassilly*.—For his reaping machines.

#### ITALY.

243 ZAPPA, LUIGI, 10 *vicolo S. Giovanni sul Muro, Milan*.—For his fire-engine.

### SECTION X.—(A.)—PHILOSOPHICAL AND PHOTOGRAPHIC INSTRUMENTS.

#### South Side of Nave.

290 CRONMIRE, J. M. & H. 10 *Bromehead st. Commercial road East, London, E.*—Cases of mathematical instruments; parallel rules; plotting scales; Marquois scales; protractors, &c., &c.

291 CROUCH, H. & W. 64A *Bishopsgate st. Within, E.C. and Commercial road, E. London*.—Microscopes (binocular and unioocular); microscope object glasses; object cabinets and apparatus.

292 DALLMEYER, J. H. 19 *Bloomsbury st. London, W.C.*—Astronomical and terrestrial telescopes; microscopes; photographic lenses and cameras.

293 FIELD, R. & SON, 113 *New st. Birmingham*.—Microscopes, telescopes, and oxyhydrogen microscope.

294 GRIERDALE, J. E. 25 *Cranbourne st. London, W.C.*—Machine for washing photographic prints.—(Passage to Refreshment Rooms, S. Corridor.)

295 HUGHES, J. 37 and 38 *Queen st. Ratcliff, London, E.*—Transit theodolite; sextants; quadrants; pocket aneroid; sympiesometer; binocular glasses; compass.

296 MEAGHER, P. 1 *Coppice row, Farringdon road, London, E.*—Photographic cameras and camera stands; bath cases containing glass baths; printing frames; plate boxes, cleaners, racks, and holders; stereoscopes, &c.—(Passage to Refreshment Rooms, South Corridor.)

297 NOTON, M. 18 *Eccles new road, Salford*.—Machine for beating up albumen used in photography; vacuum plate holder; dissolving tap, for alternately

admitting oxygen and hydrogen to the burners of dissolving view lanterns.—(Same Passage.)

298 OTTEWILL, COLLIS & Co. 24 *Charlotte terrace, Barnsbury road, London, N.*—Cameras; "Diamond" cameo backs, &c.—(Passage to Refreshment Rooms, S. Corridor.)

299 SOLOMON, J. 22 *Red Lion sq. London W.C.*—Photographic apparatus, and optical instruments.—(Same passage.)

300 SPENCER, J. & SON, 13 *Anagier st. Dublin*.—Professor Jellett's saccharometer; cathetometer, for measuring vertical heights; railway transit theodolite; levels and levelling staffs; air pumps; Cruise's endoscope; equatorial stand.

334 WARNER, W. H. *Rom, Herefordshire*.—Improved camera stand for photography.—(Passage to Refreshment Rooms, S. Corridor.)

235 WEBB, George *st. Balsall heath, Birmingham*.—Objects for the microscope; freshwater algae, &c., &c.; injections, opaque and transparent.

336 YEATES & SON, 2 *Grafton st. Dublin*.—Equatorially mounted telescopes; optical and magnetic apparatus; barometer.

337 YOUNG, J. *Dalkeith*.—Carbon for electrical batteries.

338 BURKE, J. H. 44 *Lower Ormond quay, and 12A Nassau st. Dublin*.—Photographic frames, passe partouts, mounts, &c.

## SECTION X. (B.)—MUSICAL INSTRUMENTS.

## Great Concert Hall.

**THE PIANOFORTE.**—A large proportion of the contents of the Exhibition had special interest only for the sterner sex. As a rule, the ladies took little interest in the Machinery court, or in the direct results of Manufacturing industry. In the fine arts courts many of them were at home. But when we come to deal with pianofortes, we are assured that we shall have the attention of the ladies.

A love of flowers, a love of rural enjoyment, a love of poetry, of painting, and of music, have long been encouraged in the softer sex; and those who have cultivated these resources have usually been most felicitous in after life in the charm of solacing the companions of their existence after the dull fatigue of business, and brightening their homes with a light that made the return to them looked to as the reward and blessing for weary hours of care and toil. Hence an instrument such as the pianoforte, which is so comprehensive in its capabilities, so varied in its expressions, and so powerful in its combinations, that the most simple melody and most complicated harmony can be equally drawn from it, provided the hand of the performer be cunning at its work—an instrument that demands so much practice that it furnishes daily employment for hours during the years of youth, and when the difficulties of its manipulation are conquered, becomes a comforter and resource over after—hence, we say, is the knowledge of such an instrument wisely made an important part of female education.

The spread of musical taste and the progress of the art in general has been owing so much to the extended use of the pianoforte, that it becomes a matter of much interest to enquire into its past history and present utility. No house now, from the nobleman's mansion to the cottage of the shopkeeper, is considered to be furnished without having at least one of these instruments; and the performance upon them is thought so essential to female education, that no young lady, however otherwise informed, is supposed to have been properly educated if playing the pianoforte is not found amongst the first of her accomplishments.

As we have often heard it asserted that it was not worth the labour required for proficiency, we shall pause for a few moments to enquire what are its resources, and what does it offer in return for the assiduity of years. At the present time the pianoforte has a compass of six, six and a-quarter, six and three-quarters, and seven octaves. Those in the Dublin Exhibition were of the largest extent of compass for modern requirements, and even beyond them.

Now, it is apparent that a key-board of such vast range affords to the performer many facilities, a few of which we shall enumerate.

As our readers must be acquainted with the tone of the pianoforte, its fulness and softness, its obedience to the finger for lights and shades of sound, its masterly arrangement for the suppression of *forzando*, its liquidity in scale and figurative passages, and its capability for sustaining a melody in the centre, accompanied by the most brilliant *arpeggios* at either end—it is only necessary to glance at these qualifications. But its larger and comprehensive powers for the advancement of musical knowledge, and expression of musical ideas, can scarcely be over-estimated.

The pianoforte stands alone as a chamber instrument, from which can be produced all the combinations of harmony required to convey an adequate notion of the writings of the great masters. Nay, we may almost say, a just interpretation of their mighty creations. Take the *fugues* of Bach, the lessons of Scarlatti, the concertos of Corelli; the oratorios of Handel, Haydn, and Mendelssohn; the symphonies of Mozart and

Beethoven; the operas of Weber, Rossini, Bellini, Donizetti, and Meyerbeer. Let any who have studied the pianoforte take these authors to the instrument, varied as they are in character, modes, and genius, and they will be enabled to convey to themselves and their hearers a just idea of the vast conceptions and unfading beauty of these composers. No other instrument affords the student the same power of becoming acquainted with the works of the musical fathers. No other instrument—save the organ, and that is not a household one—will give a melody amidst the most skillful and intricate harmonies, allowing the ear to trace it distinctly as if played by another hand. This great and delicious attribute of the pianoforte, Mendelssohn has exhibited exquisitely in his *Lieder ohne Worte*, drawing out its vocal witchery, and making it interpret intelligibly phrases precious with musical charms. Then for the rendering of choral works, its formation for simultaneously playing *chords* combining ten notes—or, while one hand gives the harmony in mass, the other varies it in appropriate figures—makes it an instrument unsurpassed both for student and composer.

It is worthy of remark here that all our great composers were fine pianoforte players, or first rate performers on the instruments out of which it has grown in the progress of years—namely, the clavichord and harpsichord. Those who devoted themselves to other instruments, such as the violin, violoncello, flute, oboe, &c., though they became so distinguished in their lives as to gain even European reputations, yet have left nought behind them to perpetuate their fame, and to instruct posterity in musical art; the pianoforte, or the instruments from which it originated, have been always under the fingers, and found the best medium for expressing the ideas of our mighty musicians.

It is the first instrument upon which the glorious efforts of the great modern composers have been tried, and it is the one for which all the effects have been gathered from the *score*, both vocal and orchestral, and combined as a whole to convey a proper idea of their works to future generations. This, we think, will sufficiently prove the importance of the pianoforte in the advancement of musical education. Then for social purposes, as the solacer of many a weary hour, the vanquisher of *ennui*, the cause of graceful emulation amongst the young and innocent, the addition to the joy of those who meet for enjoyment—for what would the youthful group who meet for song and dance, and their attendant smiles and laughter, do without the pianoforte? while the elder look on and listen, and are proud of the musical displays which are a continually recurring reward for their care, attention, and parental love.

The invention of the pianoforte has been attributed to Mason the poet, and is said to be purely English, but we are inclined to think this apocryphal, for it is evident that it had its origin from the harpsichord. In the latter the action consisted of a key, and what is called a jack, which was a piece of pear tree, with a small movable tongue of holly, through which a cutting of crow-quill was passed to touch the string when the jack was in action, hence the tone produced was harsh and scratchy. As the quilling of a harpsichord was generally a day's work, several means were tried to produce a softer tone with more durable materials, resulting in the present grand pianoforte, which is a harpsichord in shape, with a different action. The action at first was simply a key, a lifter, a hammer, and a damper. The lifter was a brass wire with a piece of hide leather as a head, covered with a piece of soft leather as a finish—the tone must have been very thin and wiry, the hammer being only covered with one slight piece of leather.





quite as fast as their limited powers deserved. In the last three or four years, however, the powers of the old melodeon have been gradually developed, its powers quadrupled, its compass increased, stops of variety and another manual and pedals added; and instruments of remarkable perfection in power and capacity are now presented to the public, which will entirely supersede the small pipe organs for parlour and ordinary uses.

306 KELLY, C. 10 and 11 *Charles st. Berners st. London, W.*—Pianofortes and harmoniums.

307 LOCKE, E. C. 36 *Great Ducie st. Manchester.*—Pianoforte; Peri campanula, or fairy bells, for solos or accompaniment; fairy pianettes (self-acting).

308 PICOTT, M. 112 *Grafton st. Dublin.*—Concert grand, patent improved, and oblique grand pianofortes.

309 RUST & Co. 8 *Argyll st. Regent st. London, W.*—Royal patent tubular pianoforte, with telescopic desk front and extending ends; another with desk front only.

310 SCATES, J. 15 *Westmoreland st. Dublin.*—Concertinas and wind instruments.

311 BOND, W. & J. 44 *Norton st. Liverpool.*—“Alexandra” piano, and semi-cottage pianoforte.

312 M'NEILL, J. 140 *Capel st. Dublin.*—Cornet

with detached bell; cornet with improved air passages; flugel-horn in B flat; tenor-horn in E flat.

313 WADDINGTON, W. A. 43 *Stonegate, York.*—Oblique pianoforte.

314 KIRKMAN, J. & SON 3 *Soho sq. London, W.*—Pianoforte.

315 CADDY, C. 1, 33, 38, & 39 *Liquorpond st. Gray's-Inn road, London, E.C.*—Cottage and grand pianofortes, with Mr. W. Tighe Hamilton's hand guide attached.

316 CHAPPELL, S. A. 45 *New Bond st. London, W.*—Wind instruments.

317 BUSSELL, H. 11 *Westmoreland st. Dublin.*—Pianofortes harmonium, &c.; musical publications.

318 BOCKEY & Co. 24 *Holles st London.*—Reed and brass wind instruments.

319 BESSON, F. 198 *Euston road, London.*—Cornets; self-transposing instruments; bugles; trombones; euphoneums; tenor horns; French horns; trumpets; musical instruments in paper, gutta percha, plaster of Paris, &c., &c.

320 ALLISON, R. & SONS, 108 *Wardour st. Oxford st. W. and Werrington st. St. Pancras, N.W.*—Pianofortes, models, &c.



Pianoforte in Oak shown by Messrs. R. Allison and Sons, in 1862

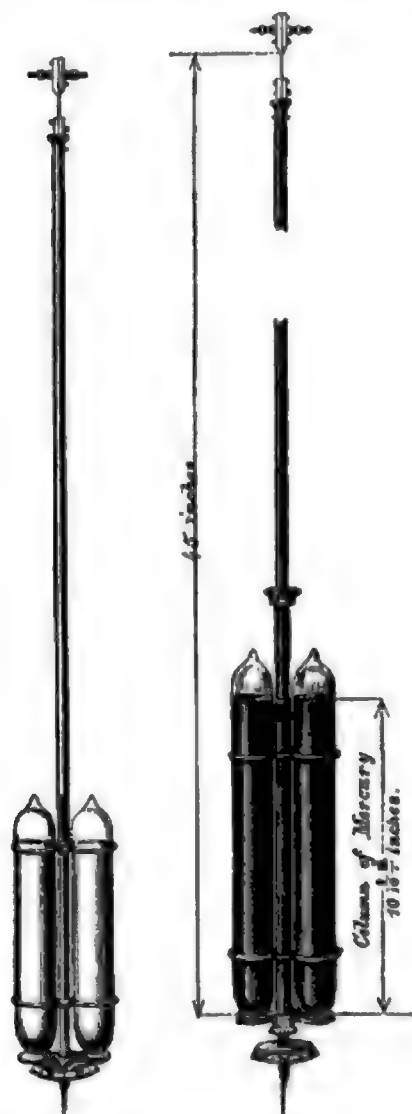


SECTION X.—(C).—HOROLOGICAL INSTRUMENTS.

South Side of Nave.

**322 CHANCELLOR & SON, 55 Lower Sackville st. Dublin.**—Chronometers, timepieces, and clocks, with patent escapement.

**323 FRODSHAM, C. 84 Strand, London, W.C.**—Chronometers, watches, clocks, and horological models.



New brass tubular pendulum, with mercurial compensation, for astronomical and other regulators.

The mode of slipping on the guides containing the mercurial tubes, will be readily understood by a glance at the diagrams. One represents the second's pendulum, and is jointed telescopically, on account of the difficulty of making a perfect tube of 45 inches in length; but even if it offered no difficulty on this account, I have preferred the pendulum in two short lengths, as more likely to be free from curvature, which leaves us only the direct expansion and contraction by changes of temperature to contend with.

**324 HOLDSWORTH, S. 54 Spencer st. Clerkenwell, London, E.C.**—Clock, chronometer, and watch jewels and pallets; horological implements and materials.

**325 KULLBERG, V. 12 Cloudesley terrace, London, N.**—Marine chronometers; watches and clocks, with Kullberg's improved "balances."

**326 ORAM, G. J. 18 and 19 Wilmington sq. London, W.C.**—Marine and pocket chronometers; watches and clocks.

**327 SMITH, J. & SONS, St. John's sq. Clerkenwell, London, E.C.**—Clocks, time-pieces, and dials.

**328 BENNETT, J. 65 Cheapside, London, E.C.**—Watches, clocks, chronometers, time ball to fall every hour, and astronomical regulators.—(North side of Transept.)

**329 BOOTH, J & SON, 4 Stephen's green, Dublin.**—Improved eight-day turret clock, with compensated two seconds pendulum, and "remontoire" discharging by half minutes.—(Transept opposite the Apse.)

The frame of this clock consists of a substantial bed-plate cast in one piece, and planed so as to present a true surface, upon which the "bearings," &c., are placed. This arrangement presents all the working parts to view, and affords great facility for adjustment, and has many advantages over the old "cage-frame" pattern; constructed as it was by numerous pieces, it was seldom rigid enough to resist the various strains put upon it, and never easy of access.

When once erected, the principal parts, as the "bed-plate," "central standards," "pendulum," &c., need not be removed when the clock requires cleaning or repairs; a matter of great importance with respect to pendulums generally, but more so in clocks of so high a quality as the one exhibited, as being "compensated" and very heavy (3 cwt.) any disturbance of its adjustment would give much trouble subsequently. This clock obtained the "only" prize medal awarded to turret clocks for "excellent design and workmanship, and also for cheapness." For further particulars see Report of the Jury, Section X. (C), page 251.

Messrs. J. B. & Son are manufacturers (by steam-power and self-acting machinery) of every description of clocks for public or private purposes. Estimates furnished upon application.











Fig. 5.—Algerine Onyx Clock.

## SECTION X.—(D).—SURGICAL INSTRUMENTS.

## South Side of Nave.

**351 GROSSMITH, W. R.** 175 *Fleet st. London, E.C.*—Artificial eyes; patent artificial arms and hands, &c.

**352 MORISON, J. D.** 8 *Wemyss place, Edinburgh.*—New dental appliances for painless extraction, &c.

**353 PRATT, J. F.** 420 *Orford st. London, W.*—Patent auricle for deafness; trusses; surgical instruments, &c.

**354 SALT, T. P.** 21 *Bull st. Birmingham.*—Patent trusses, belts, &c.

**355 THOMPSON, J.** 9 *Nassau st. Dublin.*—Surgical instruments.

**356 TUFNELL, J.** 13 *Lower Mount st. Dublin.*—Tubular bougies.

**357 THOMPSON & O'NEILL, 7 Henry st. Dublin.**—Surgical and deformity instruments.

**358 ASH, S.** 59 *Great Brunswick st. Dublin.*—Mineral teeth; dental implements and appliances.

**359 BIRD, H.** 56 *Wimpole st. Cavendish sq. London, W.*—Orthopædic appliances and mechanical apparatus for deformities, &c.

## JURY REPORT.—SECTION X. (A).

We have not found in the present Exhibition a large or very varied collection of Philosophical Apparatus, but we are able to report that some of the objects submitted to us are of an unusual merit. We would especially direct attention to the unrivalled photographic lenses exhibited by Mr. J. H. Dallmeyer; and more particularly to a new triple meniscus, by which a landscape subtending at the camera at as wide an angle as  $70^\circ$ , can be photographed with extraordinary fidelity, though not

free from distortion; and to another combination producing more limited pictures, which are in a very remarkable degree free from distortion, and of great and equal beauty throughout their whole extent. We would also direct especial attention to the originality of contrivance and refined accuracy of workmanship displayed by Messrs. J. Spencer and Son, in the collection of physical apparatus exhibited by them, particularly in a cathetometer, of rare excellence; in a Jollett's saccharometer, of very beautiful design and execution; and

in an air pump, simple in the arrangement of its parts, without valves between the pumps and the receiver, and free from regurgitation of air.

We are unable to make any report in regard to the Photographic Apparatus exhibited by E. Liesegang (*Zollverein*, 49), as it has proved impracticable to make a sufficient examination of the lenses in the absence of photographs taken by them.

We regret that the leading continental instrument makers have not been exhibitors in this department.

H. LLOYD.

G. JOHNSTONE STONEY.

DAVENPORT CROSTHWAITE.

### LIST OF AWARDS. MEDAL.

#### UNITED KINGDOM.

**290** **CRONMIRE, J. M. & H.** 10 *Bromhead st. Commercial road, East, London, E.*—For the excellence and cheapness of their drawing instruments.

**291** **CROUCH, H. & W.** 64A *Bishopsgate st. Within, E.C. and Commercial road, E., London.*—For the quality and cheapness of their microscopes, more particularly of their binocular microscopes; and HONOURABLE MENTION for cheap and good microscopic cabinets.

**292** **DALLMEYER, J. H.** 19 *Bloomsbury st. London, W.C.*—For photographic lenses, and especially for his wide-angle landscape lens, and his triple achromatic lens free from distortion; and HONOURABLE MENTION for his photographic cameras, portable telescopes, and tripod table stand.

**300** **SPENCER, J. & SON**, 13 *Angier st. Dublin.*—For the originality of contrivance and accuracy of workmanship displayed in the cathetometer, Jellett's saccharometer, and air pumps exhibited by them; and HONOURABLE MENTION for their surveying levels.

**335** **WEBB, H.** *George st. Balsall Heath, Birmingham.*—For injected preparations for the microscope, and especially for his sections of animal and mineral substances.

**202** **GISBORNE, P. N.** 445 *West Strand, London, W.C.*—For electric signals for ship-steering, mining, &c. (*We have examined and reported on this collection of apparatus at the request of the Jury of Naval Architecture, in whose department they are catalogued.*)

#### HONOURABLE MENTION.

#### UNITED KINGDOM.

**295** **HUGHES, J.** 37 and 38 *Queen st. Ratcliff, London, E.*—For his sextants.

**296** **MEAGHER, P.** 1 *Cypriote row, Farringdon road, London, E.*—For his pantoscopic camera, tourists' stereoscopic cameras, and for general excellence of workmanship.

**298** **OTTEWILL, COLLIS & Co.** 24 *Charlotte terrace, Barnsbury road, London, N.*—For workmanship of photographic cameras.

**299** **SOLOMON, J.** 22 *Red Lion sq. London, W.C.*—For a steady photographic stand, a magnesium lamp, a large woven back-ground, and several convenient photographic appliances.

**337** **YOUNG, J. Dalkeith.**—For carbons of various convenient forms for electric batteries.

#### NOVA SCOTIA.

**13** **CHISHOLM, A. M.**—For his computing scale.

#### ITALY.

**276** **MURE, BROTHERS**, 33 *via Nizza, Turin.*—For a half-hectolitre for measuring wine; on account of its simplicity and practical utility.

#### JURY REPORT.—SECTION X.—(B.)

In presenting their report upon the musical instruments now exhibited, the Jury have first to remark that neither Messrs. Broadwood, Collard, nor Erard have

entered into the competition of pianofortes. Although the instruments of Messrs. Erard and Pleyel are shown by Mr. Bussell, yet, according to the rules laid down for the guidance of the Jury, these, not being exhibited by the manufacturers, are not subject to award.

Messrs. J. & J. Hopkinson have still further improved the excellent action of their grand pianofortes, by which they have before gained medals in Paris and in London; while Messrs. Kirkman & Son exhibit, with one exception, the same grand pianofortes for which they obtained a medal in 1862.

Many of the boudoir and cottage pianofortes now shown are very deficient in damping, so that, although the dampers are carried up to A or to B flat, yet the sound of the higher notes within that compass remains more or less unchecked after the finger has quitted the key. This is especially the case where the damping action is (as most usually) placed above the hammers. The Jury wish to draw the attention of manufacturers to this continued vibration as a serious defect—one especially felt in the performance of classical music, and in accompanying the voice—prolonging sounds that ought to have ceased.

In brass instruments M. Besson (now a London manufacturer) has again carried away the palm by his numerous inventions, and by the excellence of his manufacture. The instruments of his former rival, M. Courtois, are shown, but do not compete, because they are not exhibited by the manufacturer. For the same reason, the brass instruments shown by Messrs. Roosey and Co. being, in the opinion of the Jury, of foreign manufacture, could not have a medal awarded to them. The military instruments of Austria, as exhibited by Mr. J. Stowasser of Vienna, claim a separate recognition, and the Jury recommend that a medal should be given for them; as well as to Mr. J. Higham of Manchester, for good military instruments, at moderate prices; and to Mr. J. McNeill of Dublin, for his cornet with improved air passages.

No striking novelty has been shown in church organs; but the Jury are of opinion that those exhibited by the Société Anonyme of Belgium, with tin pipes, best deserve the medal.

In harmoniums they have again given the palm to Alexandre of Paris, since much of what is good in others has been copied from him.

A very ingenious instrument is exhibited in the French Department for assisting those who have defective ears in the tuning of their pianos. Although the Jury doubt whether this invention will ever come into general use, they think that it merits recognition at their hands.

Mr. S. A. CHAPPELL, 50 *New Bond st. London (United Kingdom, 316)*, exhibits an improved clarinet, the invention of Monsieur Barret, the celebrated French oboe player, well deserving of note, but for the reasons above stated in the case of Messrs. Erard and Pleyel, this instrument cannot become subject to award. The concertinas of Mr. Scates of Dublin, with steel vibrators, are not only of most durable material, but also hardly to be surpassed in the admirable quality of their tone.

Of the Italian military instruments, exhibited by Pelitti of Milan, it is difficult for the Jury to judge fairly—the valves being dry and not acting freely; but they are of opinion that his contrabassoon and other inventions are well deserving of a medal; and that Andrea Ruffini of Naples, also deserves a medal for the excellence and perfect equality of his violin strings.

### LIST OF AWARDS. MEDAL.

#### UNITED KINGDOM.

**301** **CHAPPELL & Co.** 50 *New Bond st. London, W.*—For the 20 guinea pianette (quality not sacrificed to cheapness), and for excellence in cottage pianofortes.

**303** **HIGHAM, J.** 2 *Victoria st. Manchester.*—For brass musical instruments at moderate prices.

**304 HOPKINSON, J. & J.** 235 *Regent st. London, W.*—For improved mechanism and delicate touch to pianofortes.

**305 IMHOF & MUKLE**, 547 *Oxford st. London, W.*—For orchestration and self-acting flute organ.

**309 RÜST & Co.** 8, *Argyll-st. London, W.*—For improvements in the interior construction of pianofortes, and for external convenience of form.

**310 SCATES, J.** 15 *Westmoreland st. Dublin.*—For excellence of tone, with durability in his concertinas with steel vibrators.

**312 McNEILL, J.** 140 *Capel st. Dublin.*—For cornet with improved air passages.

**314 KIRKMAN, J. & SON**, 3 *Soho square, London, W.*—For excellent manufacture of grand pianofortes.

**319 BESSON, F.** 198 *Euston road, London, N.W.*—For numerous inventions and improvements in brass instruments.

### AUSTRIA.

**19 STOWASSER, J.** *Langejasse, Vienna.*—For brass musical instruments.

### BELGIUM.

**85 SOCIÉTÉ ANONYME POUR LA FABRICATION DES GRANDES ORGUES, ESTABLISHMENT OF MERKLIN-SCHUTZ, Brussels.**—For good manufacture of church organs and harmoniums.

**88 VUILLAUME, N. F.** *Brussels.*—For violins, tenors, and violoncellos.

### FRANCE.

**40 ALEXANDRE, Paris.**—For harmoniums.

**44 BUZIN, J. B. & Co.** *Paris.*—For the guide-accord, or instrument to assist in tuning pianofortes.

### ITALY.

**276 RUPINI, ANDREA**, 13 *vico Cordari a Buoncumino di Porto, Naples.*—For violin strings.

**277 PELITTI, GIUSEPPE**, 1077 *via Pescheria Vecchia, Milan.*—For his contrabassoon, and other inventions in military instruments.

### HONOURABLE MENTION.

#### UNITED KINGDOM.

**320 ALLISON, R. & SON**, 108 *Wardour st. Oxford st. W. and Werrington st. St. Pancras, N.W.*—For improvements in manufacture of pianofortes.

**321 BROWN, W.** 49 *Lower Camden st. Dublin.*—For small church organ.

**306 KELLY, C.** 11 and 10 *Charles st. Berners st. London, W.*—For harmoniums.

**318 BOOSEY & Co.** 24 *Holles st. London.*—For reed instruments.

### FRANCE.

**41 GEHRLING, C. Paris.**—For pianoforte actions.

### ZOLLVEREIN.

**RACHALS, Hamburg.**—For cheap manufacture of pianofortes.

### JURY REPORT.—SECTION X.—(C).

**CHANCELLOR & SON**, *Lower Sackville st. Dublin.*—No one present on the part of the exhibitor. The case contains nothing of any particular notice. The contents chiefly consist of foreign imported goods. The escapement called "patent" is a form of the dead escapement which has no advantage that we know of over the ordinary form, and is largely used in the French timepieces, which have a figure swinging to and fro under the clock, by way of a pendulum.

**C. Frodsham**, 84 *Strand, London, W.C.*—No one present on the part of the exhibitor. A beautiful collection of chronometers, watches, and chiming carriage

clocks. The well earned fame of this maker is perhaps the best proof of the excellence of his workmanship. Some detached portions of chronometers, such as balances, of excellent design and beautiful finish, are exhibited; various modes of effecting compensation for variations of temperature. The collection of watches and pocket chronometers is also very complete, and of very excellent workmanship.

**J. Schriber & Sons**, 23 *Westmoreland st. Dublin*, exhibit a most creditable and interesting collection of watches; the movements of the lever escapement, both in the finished state, and in every stage of the process of manufacture, as well as the cases, both in gold and silver. They also exhibit an "universal time watch," their own invention and manufacture, whereby the time at the principal cities in the world is simultaneously indicated on one dial. This is the only Irish watch manufacturing firm which exhibits in this Exhibition articles made entirely on their own premises. Their prices are moderate, considering the style and finish of their work.

**S. Holdsworth**, 54 *Spencer st. Clerkenwell, London, E.C.*—A large and interesting collection of watch jewels, and specimens of the jewels in the rough as well as finished; rollers, pallets, &c., for watches and chronometers. This large and curious collection was not exhibited to us out of the case, but as far as we could judge from such examination as we were able to make, it is a most complete and interesting one, besides being highly creditable to the producer and exhibitor. The workmanship appears to be most exquisite.

**V. Kullberg**, 12 *Cloudesley terrace, London, N.*—No one present on the part of exhibitor. One watch, with a neat arrangement for winding the watch and setting the hands through the handle of the watch, was exhibited and explained by Mr. M<sup>r</sup>Master of Grafton-street. The arrangement, as constructed by the exhibitor, varies from the usual method in having one of the wheels of the train communicating between the handle and the barrel with a central hole larger than the pin on which it works; and this presents a facility for putting it in and out of gear in a very simple manner, with the barrel for winding, or the hands for setting. Some chronometer balances were exhibited, with (apparently) a secondary compensation. They are very beautifully executed, but no one was present to explain the nature of their action.

**G. J. Oram**, 18 and 19 *Wilmington sq. London, W.C.*—A large collection of watches, chronometers, and clocks. There are many ingenious arrangements of stop watches with split second hands—one of the second hands being made to stop by pressing a stud, while the other continues to advance, so as to enable an observer to time accurately the commencement and conclusion of any event. There is also an improved lever escapement which appears very good, and entirely prevents "setting" of the balance—that is, the watch will commence to go again after being stopped, without any assistance from being shaken or otherwise.

**J. Smith & Sons**, *St. John's, sq. Clerkenwell, London, E.C.*—No one present on the part of the exhibitor. Some well executed timepieces, and a turret clock. This clock is well finished, but is made with an amount of strength and weight in the several parts which is the besetting fault of turret clock-makers. The pallets and scape wheel are made of a size, and with an amount of material in them which is wholly useless, and very detrimental to the going of the clock. There is a remontoire in the train, which also suffers from the same cause, and contains so much metal as to defeat, in a great degree, the very object of its introduction, viz., the doing away with the effect of friction of the train upon the rate of the clock. There are some glass dials for turret clocks, with figures on the back of the glass, and backed up with opaque white, which are very excellent for the purpose for which they are intended. The figures are clear and distinct, and the material not likely to be affected by the weather.

**J. Bennett, 65 Cheapside, London, E.C.**—A large collection of clocks, watches, some chronometers, and a turret clock. The collection of chronometers and watches exhibited is most complete and creditable. In the former class of instruments Mr. Bennett has introduced an improvement in the cock of the balance by forming it of two pieces, whereby greater facility is afforded in executing repairs when abroad, in the event of the chronometer meeting with accident. In the latter class there are several novel inventions introduced, some the invention of Mr. Bennett, others not, but all highly creditable, and at prices very moderate, considering their style and finish. The clocks are good specimens of workmanship, without anything remarkable about them. In the turret clock the train and remontoire are greatly too heavy, and involve a vast deal of unnecessary friction. The lantern pinions have their pins loose in their fittings, with the object of their turning round and thus avoiding friction. This arrangement was condemned so long ago as the London Exhibition of 1851, and we cannot approve of it now.

**J. Booth and Son, 4 Stephens green, Dublin.**—Large turret clock. This turret clock is the only one in the exhibition which is keeping time; that is, is going day and night without being stopped and re-set. It is calculated to work four large dials, and from its construction should, and we have no doubt will, keep its rate as closely as most astronomical regulators. All the improvements which have been introduced in the last twenty years (which are very many) have been adopted in it, and the workmanship is all that could be desired. It has a two-seconds pendulum, compensated (zinc and iron) for temperature, with a small collar in the rod for advancing and retarding its rate to a fraction of a second. The dead beat escapement is an excellent piece of workmanship, the spring remontoire works with great steadiness, and reduces the friction effecting the escapement to a minimum. The striking part also has great merit, raising the hammer lever by cams, and the lever itself being one of the second order, the friction is thus reduced on the pivots of the lever, and much labour to the clock is saved. All the parts of this clock are so constructed as to be removable at pleasure for cleaning or repair separately, and without requiring any adjacent or other part to be removed for the purpose. The price of this clock is marvellously low, taking into account the style and finish of workmanship, with the great accuracy of its performance hitherto.

**Aubert & Linton, 252 Regent st. London, W.**, exhibit a collection of bracket and mantel-piece clocks of superior finish, one of the latter being of an original and very handsome design in ormolu, with candelabra to match; also of watches chiefly with lever escapements of very moderate price, considering the style of finish and workmanship.

**J. W. Benson, 33 Ludgate hill, London, E.C.**—A large collection of turret and other clocks, watches, and chronometers. The ordinary clocks are of good workmanship, presenting no particular for notice. The turret clocks are commendable for some approach to delicacy and lightness in the going parts and the escapement, though they might be improved in this respect. There is a method of altering the time of the pendulum of the quarter-chiming turret clock that is going, for small fractions of time, by drawing up the spring at the top of the jib, through a slit between two piers, which is very convenient, but faulty in principle. Such a mode of regulation does not alter the rate of the pendulum by any known law, and is neither cheaper nor more convenient than a collar on the rod, with small weights to put on and take off, which does act regularly, and is capable of minute accuracy. The chimes of this clock are very good and in good tune. The watches exhibited are of very excellent finish and moderate in price, with varied and handsome designs in cases and dials. Mr. Benson also exhibits an improved lever escapement of his own invention, whereby the "setting" of the balance

is rendered impossible; also a highly interesting and unique collection of watches, from an early date in the history of watchwork (Circa temp. Jac. II.) of various construction, having cases formed of topaz, and other equally valuable materials, and all well worthy of minute examination.

**E. White, 20 Cockspur st. London, S.W.**—A fine collection of clocks, chronometers, and watches. There is a regulator here of very fine workmanship, and a very commendable instrument, combining great strength in the frame with great delicacy in the movement. The weight-line leads over a barrel to keep the weight in a convenient part of the clock case as it falls. This arrangement is not to be commended in a regulator, as it introduces unnecessarily a wheel, and the friction consequent thereon between the weight and the train. There are two handsome quarter clocks for a hall or library, which are very good specimens of work, with good chimes and bells, and are to be commended in every way; also several very handsome carriage clocks, with chronometer and other escapements of most exquisite workmanship and finish in every respect. Mr. White exhibits also a chronograph of novel construction and excellent finish, his own make though not his own invention, a watch with split seconds, so constructed as to mark and record an observation within a fraction of a second of time, which seems to be a most admirable instrument for the purpose. A pocket chronometer and minute repeater watch, both of very beautiful finish; also ornamental watches of very chaste and novel designs.

**J. McKay, 41 George st. Edinburgh**, exhibits a mode of moving the index pointers of watch and chronometer regulators for effecting fine adjustments, by means of a fine screw moving in the studs fixed in the upper plate over the index, and passing through the point of the index pointer, which it moves back or forward as is necessary.

**Kreupach, 9 Kandlgasse, and Schönberger, Franz Josef Quai, Vienna.**—Very pretty clocks—eight-day, month, and year—in cases with glass fronts. These clocks are to be commended for workmanship, the shortness of the fall, and the lightness of the weight, with the low prices at which they are offered.

**Charles Lehmann, Bienne, Switzerland.**—These specimens of watch work are exquisitely finished, and of first-rate workmanship.

**Le Roy et Fils, 13 and 15 Palais Royal, Paris, and 211 Regent st. London, W.**—A very large assortment of drawing room and study clocks, of excellent finish, in cases of varied, original, and beautiful design, among which we specially commend one having an escapement which beats dead seconds with a half-seconds pendulum, receiving the impulse of the train on only one of the pallets, the other acting only as a detent for the scape wheel, thereby reducing the friction of the escapement to a minimum, and increasing accuracy of performance, having also Bourdon's barometer, perpetual almanack, and thermometers. This firm also exhibit a small, but very choice collection of watches of their own manufacture, among which is one with independent centre seconds hand, beating dead seconds without having a second train for that purpose—their own invention. Several very handsome ladies' ornamental cased watches, including one, the back of which is formed altogether of a stone called jasp, of excessive hardness, in which are set rubies and diamonds, the whole forming a very handsome ornament. The prices asked for the productions of this firm are moderate, considering their workmanship and finish.

**Schwenningen Clock and Watch Manufactory, Württemberg.**—Burk's portable control watch. This is a watchman's watch, of a small and portable size, and registers the attendance of the watchman on slips of paper, which can be kept in a book after use. The arrangement is good, and enables a registry to be kept of a very large number of intervals through the twenty-four hours—more, indeed, than could ever be necessary.

The watch may also be used to note the attendance of the watchman at various places on his beat by keeping a separate key fastened to each place, each key producing a different impression on the slip of paper, showing where and when it was made.

O. Dilger (*Baden*) exhibits a large collection of cuckoo clocks of very novel and handsome designs, and at very moderate prices.

E. X. Wehrle, *Purtwangen, Baden*, exhibits a two-part clock, with handsome case of carved walnut wood, having the figures on the dial and hands made of lime wood. From the front of this clock, below the dial (after each hour is struck), march two miniature trumpeters, who play a very effective trumpet call, and when finished, march back and shut the door in the case whence they came out.

Carlbian & Corbière, 69 *Cannon st. East, London, E.C.*, exhibit a large collection of French clocks, which it is impossible, in our opinion, to offer an opinion about. Their merit depends upon their cases, as the works are in the well known style of French drawing-room clocks.

Ducanini, *Florence*.—Tacheometer; an ingenious instrument, combining with the registry of distances the indication of time.

J. FAVIERE ELRINGTON, LL.D.  
R. J. T. MACRORY, A.M.  
DAVENPORT CROSTHWAITE, A.M.

## LIST OF AWARDS.

### MEDAL.

#### UNITED KINGDOM.

323 FRODSHAM, C. 84 *Strand, London, W.C.*—For excellence of workmanship in chronometers and watches.

324 HOLDSWORTH, S. 54 *Spencer st. Clerkenwell, London, E.C.*—For excellence of workmanship in watch and chronometer jewels and pallets.

326 ORAM, G. J. 18 and 19 *Wilmington sq. London, W.C.*—For finish and original inventions in watches.

329 BOOTH, J. & SON, 4 *Stephen's green, Dublin*.—For excellent workmanship and design of his turret clock, also for cheapness.

330 AUBERT & LINTON, 252 *Regent st. London, W.*—For style and finish, with moderate prices of watches.

331 BENSON, J. W. 33 *Ludgate hill, London, E.C.*—For watches.

332 WHITE, E. 20 *Cockspur st. London, S.W.*—For excellence of workmanship of chronometers, watches, and clocks.

653 SCHRIEBER J. & SON, 23, *Westmoreland-st., Dublin*.—For finish of watches, and moderate price of watch movements, in Section X. (C.) Also for well made watch-cases, in Section XXIII.

#### AUSTRIA.

38 KRESPACH, A. 9, *Kandlgasse, Vienna*.—For workmanship and extreme cheapness of his clocks.

40 SCHÖNBERGER, W. *Frans Josef Quai, Vienna*.—For workmanship and extreme cheapness of his clocks.

#### FRANCE.

39A LEROY & SON, *Paris and London*.—For excellence of finish and design of articles exhibited; also for original dead second escapement.

#### SWITZERLAND.

10 LEHMANN, CH. *Bienne*.—For exquisite finish and first-rate workmanship.

#### ZOLLVEREIN.

114 SCHWENNINGEN (TOWN OF) CLOCK AND WATCH MANUFACTORY, *Württemberg*.—For simplicity and effi-

ciency of invention exhibited in their portable control watch.

## HONOURABLE MENTION.

### UNITED KINGDOM.

328 BENNETT, J. 65 *Cheapside, London, E.C.*—For improvements in chronometers and watches.

327 SMITH, J. & SON, *St. John's sq. Clerkenwell, London, E.C.*—For glass dials.

### ITALY.

279 DEGANINI, *Florence*.—For good workmanship in his tacheometer.

## JURY REPORT.—SECTION X. (D).

THE number of contributors under this head was limited, amounting to nine only from the United Kingdom, and four from abroad.

Of the former, three were from London, viz., Messrs. Bigg, of Wimpole street, Cavendish square; Grossmith, of Fleet street and Pratt, of Oxford street. From Edinburgh there was only one, Mr. Morrison, of Wemyss place, whilst Birmingham sent the same number, being represented by Mr. Salt.

Dublin had four exhibitors, viz., Messrs. Ash, Thompson, Thompson and O'Neill, and Tufnell, but the latter gentleman acting in the capacity of juror was not entitled to compete.

In the Foreign Department there were four competitors, viz., Potter, of Toronto, in Canada; Briziano, of Milan; Monti, of Florence; Goldschmidt, of Berlin. These comprised the whole; and though not numerically strong, the articles exhibited were respectively of first-class character, and as such, showed that great labour and high art had been spent in their construction.

Selecting the contributors alphabetically, the first that came under our notice was Mr. Ash, of 59, Great Brunswick street, Dublin, and the articles exhibited by him are those connected with dental surgery and diseases of the teeth, mineral teeth, dental implements and appliances in every variety and form. The branch of industry specially adopted by Mr. Ash, and now we believe for the first time introduced into Ireland, must be regarded as of the utmost importance, for so completely does the general health of each individual depend upon a sound and proper power of mastication, that the affording to the practising dentist of an immediate and ready access to every adjunct he can require, thus rendering him independent of England or the Continent for supply (with the necessary accompaniment of delay), must be the conferring of a public boon. The mineral teeth, too, manufactured and exhibited by Mr. Ash, are most natural in form and colour, whilst the vulcanised rubbers, for colour, and as a medium of attachment cannot be surpassed. The manufacture and finish of the instruments and appliances in dental surgery are equally good. We award, therefore, a medal to Mr. Ash.

Mr. Bigg, of No. 56, Wimpole street, Cavendish square, London (No. 359 in the Catalogue), exhibits orthopaedic appliances and mechanical apparatus for deformities. Of all of these the workmanship is excellent, and the lightness in combination with strength remarkable. These are points so particularly desirable of attainment in the class of cases for which such assistance is required as to render Mr. Bigg every way deserving of the medal which we beg to recommend him for.

Mr. Grossmith, in consequence of severe domestic affliction, was not able to attend the meeting of the jurors, and the contents of his case could not therefore be manually examined, but from specimens of the artificial eyes since forwarded by Mr. Grossmith for inspection, we would report most strongly in his favour, and recommend a medal for him also.

Mr. Morrison, of No. 8, Wemyss place, Edinburgh, exhibits an entirely new dental appliance, for the painless extraction of teeth, the object of which is by forcing a stream of cold air through the centre of the extracting forceps, to anaesthetise all structure in the vicinity of the teeth to be removed. The idea is ingenious, and deserves Honourable Mention; but its practical success, before recommending it for a medal, requires evidence from members of the profession of its carrying out in practice Mr. Morrison's intention.

Mr. Pratt, of 420, Oxford street, London, contributes a patent auricle for deafness, trussesa, surgical instruments, &c., all of which are deserving of careful inspection and comment. Amongst the principal objects worthy of the surgeon's notice are an écraseur, to which has been added a pair of friction rollers, thereby lessening the liability of breaking the chain, coupled with an increased facility of movement; and his support for spinal disease, in which a central column is employed in place of the usual double support, this column being bifurcated where required in consequence of the vertebral disease. The case of vesico-vaginal instruments exhibited and manufactured by Mr. Pratt, is most perfect in completeness and finish, and his metrotome and ovariectomy clamp for cautery of the pedicle, are very good. We beg to recommend Mr. Pratt for the Medal.

Mr. Salt, of Birmingham, exhibits patent trusses, hernia and other belts. His truss pads are particularly good; and from the absence of all stitching, much more durable than any of the ordinary kind. His abdominal belt, too, is good, but the double truss we cannot recommend, as we conceive it possible that the bar which connects the two pads in the supra-pubic region, might, in the case of a severe fall in the hunting field, be the cause of a severe accident.\* For the improvement in the hernia pad we beg to recommend a Medal to Mr. Salt.

Mr. Thompson, of Nassau street, is entered in the Catalogue No. 355, as exhibiting surgical instruments, but the case containing cutlery only does not come under the jurisdiction of your Committee.

The case of Messrs. Thompson and O'Neill, of Henry street, will bear comparison with any in the Exhibition, whether from England or elsewhere, for variety of instruments shown, their adaptability for use, under their several classes, and excellence of manufacture; the lithotrites are very good. No person conversant with cutlery can examine the contents of this case without feeling pleasure in contemplating the high class of workmanship in steel which Irish artisans are capable

\* Since our examination of the instruments, we have been informed by Mr. Salt that the truss exhibited by him was not one completed for wear, and he has forwarded one for our inspection ready for use. After examining it we beg to withdraw the objection taken above.

of producing. We beg to recommend Messrs. Thompson and Co. for the Medal.

Amongst the foreign exhibitors in Section X. D, the only contributors whose production we deem deserving of reward is Mr. Goldschmidt, of 20, Dorothea street, Berlin. His surgical and orthopaedic instruments are very well made; and there is a truss pad that is deserving of merit, if its intention and practical working be a capability of adjustment that may be varied to meet the peculiarities of different cases. We could gain no information from the person in charge, as to the intention of the inventor, or explanation in reference to the uses of this pad, but, presuming them to be such as from a close inspection of the instruments we suppose, we beg to recommend the name of Mr. Goldschmidt for Honourable Mention.

JOLIFFE TUFNELL, F.R.C.S.I.  
BENJAMIN M'DOWEL, M.D., T.C.D.

### LIST OF AWARDS. MEDAL.

#### UNITED KINGDOM.

351 GROSSMITH, W. R. 175 Fleet st. London, E.C.—For artificial eyes.

353 PRATT, J. F. 420 Oxford st. London, W.—For improvements in surgical instruments of various kinds.

354 SALT, T. P. 21 Bull st. Birmingham.—For improved truss pad.

357 THOMPSON & O'NEILL, 7 Henry st. Dublin.—For excellence of workmanship, variety of instruments, and general utility of those exhibited in Section X. D. Also for cutlery and steel goods in Section XXI.

358 ASH, S. 59 Great Brunswick st. Dublin.—For excellence of manufacture of dental instruments and mineral teeth.

359 BING, H. H. 58 Wimpole st. Cavendish sq. London, W.—For orthopaedic appliances, excellent workmanship, and lightness of construction.

#### HONOURABLE MENTION.

#### UNITED KINGDOM.

352 MORRISON, J. D. 8 Wemyss place, Edinburgh.—For the invention of dental appliances for the painless extraction of teeth.

#### ZOLLVEREIN.

50 GOLDSCHMIDT, S. 20 Dorothea st. Berlin.—For improved truss pad.

## CLASS C.—TEXTILE FABRICS.

### SECTION XI.—COTTON.

#### South Gallery of Nave.

THE cotton trade in Ireland is found in six counties only; it has entirely disappeared from six. In 1862 there were 1,462 persons employed in this trade in the county of Waterford, 639 in the county of Antrim, and 492 in the county of Dublin. There is not in any county a single instance of the number of cotton mills increasing since 1839. In Londonderry and Tyrone, however, it is new. In 1862 the total number of mills was 9, and the number employed 2,734. A new factory has been lately erected in Drogheda.

The imports of cotton in the United Kingdom in the past two years were:—1864, 2,587,000 bales; 1865, 2,755,000 bales. The home consumption being respectively 559,726,370 lbs. in 1864, and 718,428,470 lbs. in 1865.

371 BROOK, J. & BROTHERS, *Meltham Mills, Huddersfield*.—Patent glacé thread; sewing cotton; crochet and embroidering cotton.

372 EVANS, W. & Co. *Derby*.—Sewing, crochet, knitting, and embroidering cottons; patent glacé thread; cotton for sewing machines.

373 CLARK, J. & R. & Co. *Burnside Thread Works, Paisley*.—Thread.

374 SHANKS, W. & SONS, *Bridge of Weir, near Paisley, N.B.*—Thread and twisted yarns.

## SECTION XII.—WOOLLEN AND WORSTED.

### South Gallery of Nave.

IN this section there was a magnificent display of woollen fabrics; and although some of the best manufacturers of Scotland and the West of England were represented, it was gratifying to find that Irish makers exhibited very creditable specimens of the produce of their factories. If the linen trade exemplifies the development of Irish resources and the expansion of Irish industry, the manufacture of wool shows the opposite picture.

It has been a question much agitated, whether, circumstanced as Ireland is, the woollen manufacture be one to which industry should be turned. The state of this manufacture in Ireland, at a former period, certainly affords good general ground for believing that it is well adapted to the country. That it was known here at a very early period, and that Ireland excelled in a variety of its branches, has been fully proved in an essay by an early President of the Royal Irish Academy within the close of the eighteenth century. With respect to its state at a later period we have the testimony of various writers—and that of Lord Strafford in particular is explicit:—"that of the few manufactures known in the country in his time, that of wool was the principal." The following is an extract from a letter of his, giving an account of the report he had made to the king and council. It is dated July 25, 1636:—

"That there was little or no manufacture among them but some small beginnings towards a cloathing trade which I had, and so should still discourage all I could, unless otherwise directed by his Majesty and their lordships; in regard it would trench not only on the cloathings of England, being our staple commodity; so as if they should manufacture their own wool, which grew to very great quantities, we should not only lose the profit we made now by in-draping these wools, but his Majesty lose extremely by his customs; and, in conclusion, it might be feared, they might beat us out of the trade itself by underselling us, which they were able to do. Yet have I endeavoured another way to set them to work, and that is by bringing in the making of linen cloth, the rather in regard the women are all naturally bred for spinning, that the Irish earth is apt for the bearing of flax, and that this manufacture would be, in conclusion, rather a benefit than other to this kingdom. I have, therefore sent for the flax seed into Holland, being of a better sort than we have, and have sown this year a thousand pounds of it (finding by some I sowed the last year that it takes very well there). I have sent for workmen out of the Low Countries and South of France, and set up already six or seven looms, which if it please God so to bless us this year I trust so to invite them to follow it, when they see the great profit arising thereby, as that they shall generally take and employ themselves that way, which if they do, I am confident it will prove a mighty business."

By this testimony of an English nobleman, it appears that Ireland abounded in wool; and that though manufactures generally were in a state of depression, yet that of wool had made some progress—a sure proof that it was the manufacture to which, of all others, the country had the strongest bent. Such, too, it appears, were her means of carrying on this manufacture successfully that there was great reason to fear, in a little time, Ireland would beat Great Britain out of her staple manufacture, though it had been the general policy of Lord Strafford to discourage the woollen manufacture and to encourage that of linen, yet so little effect had his endeavours in depressing the manufacture of wool that in 1697 it still remained in such a state as to alarm the jealousy of England. In consequence of this the English Legislature prohibited the export of woollens from Ireland. Under such restrictions it was impossible that the manufacture should prosper. It sunk to a very low ebb indeed. If Ireland more than a century and a quarter ago was filled to excess in the woollen manufacture, she is not now incapacitated for it. At present Ireland undoubtedly possesses means of carrying the manufacture of wool much farther than she has yet done. There are about three and a-half millions of sheep in the island, the fleeces of which furnishes ample raw material. But the rearing of sheep has been much neglected, and cattle rearing has the preference. As the restrictions were removed the woollen manufacture began to show signs of returning vigour and prosperity; but these were checked by the exercise of that fatal power of combination which has so often in this country set the employed against the employer, and divided interests which should have been identical. Thus perished the Kilkenny blanket trade, thus disappeared the staple manufacture of Cork; and it is only of late years that attention has been directed to the waste of strength, the

neglect of natural resources, and the strange apathy of capitalists with respect to a department of labour which might, in the South and West of Ireland, become quite as prosperous as the linen trade of the North. Why should the fleeces of a pastoral country like Ireland go to the factories of Leeds and Bradford and Rochdale? Why should not its water-power be utilized? It may be quite impossible to equal the English broadcloths, but there is a good home market for doeskins and tweeds, and native manufacture ought to be able to supply all the demand. Every one who entertains these views will be happy to see the progress which is being made in this department of Irish trade.

The woollen manufacture is now confined to Dublin, Cork, King's County, Waterford, Kilkenny, and Queen's County. There appears to have been a positive decrease of factories in use between 1839 and 1850, no doubt owing to a decline in the trade, which has revived since, and the discontinued factories have been re-occupied.

The total number of counties manufacturing is ten, and in these there are only four in which there are 100 persons employed in the aggregate, viz., Dublin, Cork, Westmeath, and Kilkenny. The trade has entirely left Kildare and Wicklow, and has been established in Fermanagh, Limerick, Meath, and Westmeath since 1839, and a great improvement has been made in the machinery.

There were 22 exhibitors of woollens, of whom 20 were Irish. Of course, no Irish manufacturer could hope to equal, under present circumstances, the splendid meltons and beavers of Irwin, of Leeds, and Ackroyd, of Halifax, or the fancy goods of Greenwood, Hanson, and Co., of Huddersfield. In texture, colour, pattern, and finish, these cloths are perfection, and show that not only the finest machinery, but a large amount of artistic taste is engaged in the English woollen trade. Messrs. Hooper and Co., of Eastington Mills, Gloucestershire, show a great variety of waterproof clothes and kerseymeres. Messrs. Wise and Leonard, of Stroud, take even a higher range in their meltons and beavers.

The woollens and worsted of Irish manufacture exhibited indicate the flourishing condition to which the woollen trade might be brought in this country. Very fine broadcloth is produced by Messrs. Clibborn, of Moate. The material is good, and the style is very satisfactory. Furthermore, they have made a name for the manufacture of tweeds, and no fabrics are more substantial or elegant in design than those here displayed. Hill and Hughes, of Inchicore, had an excellent assortment of friezes, and these were remarkable for finish and strength. Logan, of New-row, South, showed some admirable tweeds; and M'Cracken and Sons, of Clane Mills, county Kildare, have been very successful in the coarser kinds of woollen goods. The Messrs. Read, of Rathfarnham, not only afford considerable employment, but produce cloths of a very creditable description; and there can be no better tweeds adapted to general use than those shown by Messrs. F. and R. Scott, of Island Bridge Mills. Admirable tweeds come from the factory of Mahony, Brothers, of Cork. Some of the greatest firms from the North and West of England are well represented, and the visitor, even if ignorant of the processes of the woollen manufacture, could not help standing for a moment before the case of Messrs. Laing and Irvine, of Hawick, which was stocked with tweeds of the choicest and most pleasing patterns and the neatest textures.

**380 GANLY, SONS, & PARKER, 18, 19, and 20 Usher's quay.**—Irish grown wools.—(*Agricultural Hall, Kildare st.*)

During the war, prime Irish wool ranged very high. The damp climate, and the absence of long-continued frosts, imparts to Irish wools a softness, fineness, and pliancy which fit them for the finest class of woollen goods. It is surprising to learn the prices which were realized for wool fifty or sixty years ago. At a wool sale at Messrs. Bury's, of Dublin, on the 17th July, 1809, 2,066 bales of wool, weighing 6,004 lbs., were sold at prices averaging four shillings and two pence per lb., or £3 6s. 8d. per stone; the weight of each lot of fleeces varied from 2lbs. per fleece to 4lb. 11oz. At their sale on the 29th August, 1810, 4,494 fleeces were sold, weighing 12,807lbs., the average price being three shillings and ninepence per lb., or £2 9s. 10d. per stone.—*Irish Industrial Magazine.*

**381 CLIBBORN, T. & J. Newtown Factory, Moate.**—Broadcloth; kerseymeres; Meltons, doeskins, fancy Tweeds, Tweeds, and flannels.

**382 RINDER, W. & SONS, 57 Albion st. Leeds, Yorkshire.** Black superfine cloths.—(*Agricultural Hall, Kildare st.*)

**383 HOOPER, C. & Co. Eastington Mills, near Stonehouse, Gloucestershire.**—Waterproof and other cloths; kerseymeres; doeskins; patent elastics for trousering, &c.

**384 GREENWOOD, HANSON & Co. Railway st. Huddersfield.**—Fancy woollens.

**385 HAYES, R. Archerstown, Thurles.**—Friezes, Tweeds, blankets, flannels.

**386 HILL & HUGHES, Blue Bell, Inchicore, Dublin.**—Friezes, Meltons, Tweeds.

**387 LOGAN, J. 18 New row, South, Dublin.**—Irish friezes and Tweeds.

**388 M'CRACKEN & SONS, Clane Mills, co. Kildare.**—Friezes, blankets, Tweeds.

**389 NICOLLS, A. Brown st. Cork.**—Blankets, swanskins, flannels, Tweeds, friezes, cloths, &c.

The number of persons engaged in the Irish Woollen Manufactures gradually lessened after the war in the early part of the century. The making of blankets, for which Kilkenny was famous, disappeared; ratteens and friezes ceased to be made at Roscrea—stuff serges at Mountmellick; and at length there was only a tradition of that manufacture, which in 1800 excited the alarm of the manufacturers of the sister country.

The trade has, we are glad to say, again taken root; the first impetus in the south of Ireland was given by that very popular and patriotic nobleman, the late Marquis of Waterford, who encouraged the manufacture of frieze, at Kilmacthomas, a small town on his estate in the county of Waterford, and made it fashionable by wearing it himself. The *Waterford Frieze* became known upon the racecourse and in sporting districts; the manufacture revived; other mills were set to work, and the trade has gradually gathered strength. The

superiority of the Irish manufactures arises from the excellence of the wool; an article is produced intrinsically the cheapest that can be worn; while the use of shoddy, with which we are happily unacquainted, in many of the cheaper fabrics, has given the inferior English cloths a bad character in the market.

There is a growing demand for Irish cloth, and English houses have offered much larger orders than the manufacturers can execute. They hardly think it worth their while to purchase the small lots which the Irish firms can now sell; they would buy pieces in thousands, which are now only offered in hundreds.

There was a decrease in the number of woollen factories in Ireland between 1839 and 1856. Since that time there has been an increase. In 1856 there were twenty-seven woollen, and six worsted factories; total thirty-three; in 1863, there were thirty-nine woollen and three worsted factories, making a total of forty-two. The woollen factories of Ireland are smaller than those of Great Britain. The average number of hands employed in each woollen factory in the latter is fifty-two, and in the former twenty-two.

These views are sustained by the last Report of the Inspector of Factories, (31st October, 1865), which contains the following passage:—"I am glad to notice great improvements in the woollen manufacture. New machinery is being introduced on all sides, and a considerable trade in tweeds is springing up. One firm has been executing orders for England, and it is represented that, if mills on a larger scale were established, there would be a good foreign trade. At present the mills are only able to undertake small orders, and those chiefly for home markets. There are many large mills in all parts of Ireland, built for corn grinding, now standing idle in consequence of the diminished growth of grain, and admirably suited for manufacturing purposes. Some are well suited for communication with the coast and by railways, and are offered at low rents. Labour is cheap, and work plentiful. Capital is the only thing wanted. But there appears little enterprise in this country, and even limited liability does not stimulate the growth of companies here. It has been suggested to me, that if the cloth of the Constabulary was offered to Irish manufacturers it would encourage the trade greatly. I am afraid this is against the laws of political economy, and quite an exploded fashion of fostering a trade; but, if practicable, it might call into being mills and machinery which would have plenty of work afterwards; and it seems generally admitted that some extra encouragement is required in this country for the employment of the poor. From the very favourable reports I hear of the woollen trade, I think it may possibly yet be very greatly extended. It was once the trade of the country, and, as it appears to me, the natural one."

Irish wool is, from its softness, fineness, and strength, admirably adapted for fine textures, such as challies, cashmeres, llamas, mousseline de laines, and other similar fabrics. Our finer wools are now sent to France, to be worked up there. The manufacture of these fine wools would, in proportion to the material used, afford a larger amount of employment than the finer cloths.

There is abundant room for much more employment in this branch of trade; fancy and skill might be largely brought to bear upon the fabrication of woollen goods. The annual crop of Irish wool may be estimated at nearly 16,000,000 lbs.; there are no statistics of the quantity used in domestic manufacture, as the exports of wool from Ireland are not given in the Board of Trade returns. The imports of wool into the United Kingdom exceeded the exports in 1853 by 107,671,080 lbs.; in 1863, by 113,449,703 lbs.; and in 1864, by 150,539,306 lbs. The annual clip of Great Britain may be estimated at 100,000,000 lbs.—JOSEPH FISHER, in *Irish Industrial Magazine*.

390 READ, J. & J. Edmondstown, Rathfarnham.—Woollen manufactures.

391 SCOTT, F. & R. & Co. *Island-bridge Mills, Dublin*.—Irish friezes, Tweeds, and Meltons.

392 WISE & LEONARD, *Nailsworth and Holcombe Mills, near Stroud, Gloucestershire*.—Cloths, doeskins, beavers, and Meltons.

393 HARRISON, G. & Co. 31 North Bridge, *Edinburgh*.—Scotch Tweeds.

394 IRWIN, E. 30 Albion st. *Leeds*.—Cloths, Meltons, beavers, doeskins, &c.

395 GRUNDY, E. & SONS, 26 High st. *Manchester*.—Flannels, swanskins, plaidings, blankets, printed felts and druggets, &c.

396 MAHONY, M. & BROTHERS, 3 Camden quay, *Cork*.—Irish Tweeds.

398 LAING & IRVINE, *Hawick, N.B.*—Scotch tweeds.

399 WALL, S. *Blue Bell Mills, co. Dublin*.—Woollen cloths.

400 HUNT & WINTERBOTTOM, *Cam and Dursley Mills, Gloucestershire*.—West of England broadcloths, &c.

401 BLAND, J. H. —Wool. — (*Agricultural Hall, Kildare st.*)

The supply of home-grown wool is in favour of Irish woollen manufacture. This is very large, and may be estimated at one-eighth the whole quantity manufactured in the United Kingdom; or equal to one-fourth the total imports. But, important as this would be, it must be put in a subordinate place (as in the case of every manufacture the raw material of which has to be imported largely) to that advantage which arises from the practicability of erecting factories near the sea-board, and the nearness of the island to the raw material producing countries. Ireland is nearer than England to Australia, the East Indies, South America; and equally as approachable, if not positively nearer, on the average, to all the other places from which British manufacturers draw their supply of wool. For the washing of wool no rivers are more suitable than those of Ireland. Even at present Ireland is a good market for woollen cloths. But, with a population busily engaged, at good wages, this market would, under the extensions already projected, double its present business. The enormous quantity of labour performed in the towns of Leeds, Huddersfield, Bradford, Halifax, Dewsbury, and other parts of Yorkshire, where the woollen trade is flourishing, contrasted with the quiet way in which work is done in Ireland, shows how much is to be done. A stranger may pass through some places in Ireland where there are woollen or worsted factories, and, except he be a close observer, or acquainted with the trade, he may not notice the factories at all. No more mistaken policy could be adopted than the "small scale," quiet and "easy style" of action common in Ireland, and it is especially injurious to the woollen trade. That prosperity in the woollen trade, which rests on a preference given to Irish manufactures as such, or the fashion of wearing frieze, is both unsafe and uncertain. Unless Irish-made woollens are as well finished, as firm dyed, and as cheap as any other, no one ought to be expected to buy a yard. But as the Irish manufacturer may meet all these demands, the sooner his trade is dependent on fair, open competition, and on that alone, the better.—W. G. CHORY.

402 ROBERTS, JOWLINGS, & Co. *Lightpill Mills, Stroud, Gloucestershire*.—Cloths and doeskins.

NOTE.—We are glad to learn that a company is in the course of formation for the purpose of working on a large scale the "Ormond Woollen Mills," in Kilkenny, the property of the late Mr. Kenny Scott, and once so famous for the manufacture of blankets. We believe the movement was originated through the patriotic spirit of the Mayor and corporation of Kilkenny, in order to continue a source of constant employment for the working classes of that city.

The factory is situate in the centre of an extensive wool-growing country; and the water of the river Nore, which supplies the water power, from its softness and

chemical properties, is singularly adapted for the purposes of dying. These natural advantages, coupled with the fact that the goods proposed to be manufactured, namely, frieze and tweeds, command a ready

market both at home and abroad, leave but little doubt that the Company, setting aside the advantages it will confer in a national point of view, will prove a profitable investment.

## SECTION XIII.—SILK AND VELVET.

## South Gallery of Nave.

THE silk trade in Dublin was introduced by some of the French Huguenots, the chief of whom was Mr. La Touche. The banking-house in Castle-street derives its origin from that early period; the high character which the Mr. La Touche of that day held, led to his place being the depository of the funds of the infantile community. In 1745, the Weaver's Hall was built, at the sole expense of Mr. J. Digges La Touche, at which period an organization was effected for the protection of the interests of the trade. Following up the policy adopted in England, an Act was passed in 1784, placing the silk manufacture under the especial care of the Royal Dublin Society; that Society being armed with extraordinary powers, and liberally supplied with funds for the attainment of the object in view. A grant of £8,000 was voted, the first allocation of which was to the establishment of a warehouse "for the sale of silk goods manufactured in Ireland." The new emporium, which was situated in Parliament-street, was placed under the management of six merchants acquainted with the trade; and one of their preliminary announcements was the offer of £10 "to all manufacturers who should deposit on sale in the warehouse silk goods manufactured in the country after the 1st June, 1784." The immediate effect of this system of bounties was to lead to the perpetration of the most scandalous frauds. The payment of a premium of £10 to all who should deposit for sale a certain quantity of goods was well calculated to excite the ingenuity of needy manufacturers to devise means to multiply the premiums. For this purpose they had only to enter into combination with some of the retail houses; and the result was that the same piece of goods was again and again deposited by the same party, who obtained on every occasion the sum of £10 for the deception which he practised. From the early records of this warehouse it would appear that the silk trade was at that period in a most flourishing position. The extent to which the frauds under this bounty system were carried at length attracted the attention of those appointed.

Mr. Wallace, in a published essay on the Manufactures of Ireland, published in 1798, says:—

"Of the silk manufacture there are four species, which seem beyond others to call for encouragement; these are handkerchiefs, modes, pulings, and ribbons. In modes, principally used for cloaks, we already imitate the best productions of the kind in England; and however high the character of English modes may be in Ireland, it is certain that the consumption of Ireland is, in a great degree, supplied by the Irish manufacturer. The manufacture of modes is worth attention for another reason; it is not variable as the other branches of the silk manufacture. They are a species of goods which are always likely to be in demand, and therefore always likely to employ a considerable number of people.

Pulings and persians are in a certain degree valuable for the same reasons. The Irish maker has already attained such a degree of perfection in these fabrics as almost secures to him the home market. Little or no English pulings or persians are exported. They are also a kind of goods which, as they are used in linings, and other unimportant articles of dress, are likely to suffer few changes from the variations of fashion. Accordingly a great number of the silk weavers of Dublin are employed on them.

"With respect to ribbons there seem to be no

impediments in the way of Irish manufacture. It is a branch which requires little capital, which, though it depends somewhat on fashion, yet can easily and with little expense, admit such changes as fashion may dictate. It is, too, an established manufacture, all the improvements of which that are known in England we have already adopted. It is, perhaps, still more strongly recommended by furnishing employment as well to the women and children of the country as to the men; and certainly if the charge of idleness is fairly applicable to Ireland, it is to the women and children that it applies. By far the greatest part of the ribbons made in Dublin are woven by women, and female children under fifteen years old. Could the women and children be thus brought into operation in the other manufactures, even in the less important parts of the process, Ireland would soon become a much more dangerous rival to Great Britain than she now is.

"In the handkerchief branch Ireland has long enjoyed celebrity throughout Europe. For texture and durability she is not exceeded by any other country in this manufacture."

403 TAYLOR, S. & STOKES, 45 Friday st. London, E.C. — Moires antiques, velvets, and satins.

404 CHADWICK, J. 12A Moseley st. Manchester, and West Houghton, Lancashire.—Broad silks.

405 SLATER, BUCKINGHAM, & Co. 35 Wood st. London, E.C.—Silk scarfs, cravats, handkerchiefs, &c. &c.

## CLASS C.—TEXTILE FABRICS.

## MEMBERS OF THE JURY.

Alderman ATKINSON, Poplin Manufacturer,	Dublin.
K. T. BOWLEY, Boot and Shoemaker,	London.
FEDERICO LANGLA, Duke of BROLO,	Italy.
W. CHARLEY, Linen Manufacturer,	Belfast.
J. E. CROSBY, Sail and Rope Manufacturer,	Dublin.
A. C. CHURTON,	Bradford.
ISIDORE CORBIÈRE, Merchant,	France.
G. DELANT, Silk Mercer,	Dublin.
J. G. FITCH, M.A., one of H.M. Inspectors of Schools,	London.
FORTAMPA, Senator, President of the Belgian Commission,	Belgium.
JOHN FRETWELL, Merchant,	Zollverein.
PETER GRAHAM, Upholsterer,	London.
A. HOLMES, Coach Builder,	Derby.
G. N. HOOPER, Coach Builder,	London.
T. M. HUTTON, Coach Builder,	Dublin.
J. KERSHAW,	Dublin.
P. LANGAN, Dyer,	Dublin.
J. F. LOMBARD, Merchant,	Dublin.
JOS. METCALF, Lace Warehouseman,	Dublin.
R. MILLNER, Wool Merchant,	Dublin.
Sir PERCY NUGENT, Bart.,	Dublin.
A. PARKER, J.P.,	Dublin.
J. W. PETERS, Coach Builder,	London.
LOUIS PETRE, Merchant,	Belgium.
W. K. SULLIVAN, Ph. D., Prof. of Chemistry, Museum of Irish Industry,	Dublin.
ALEXANDER VON SYBEL, Commissioner for Prussia,	Zollverein.
J. WHELAN, Wool Factor,	Dublin.
R. WILSON, Linen Merchant	Dublin.

## SECTION XI.—COTTON.

## LIST OF JURY AWARDS.

## MEDAL.

## UNITED KINGDOM.

- 371 BROOK, J. & BROTHERS, *Meltham Mills, Huddersfield*.—For excellent patent glacé thread.  
 372 EVANS, W. & Co. *Derby*.—For excellent sewing and knitting cotton, and cotton for sewing machines.  
 373 CLARK, J. & R. & Co. *Burnside Thread Works, Paisley*.—For excellent thread.

## MALTA.

- 2 MICALFEP, SALVATORE, 82 *Strada Pietro*.—For very good cotton counterpanes.

## BELGIUM.

- 89 NICOLET & Co. *Cureghem, Brussels*.—For excellent sewing thread.

## FRANCE.

- 45 THIERRY-MIEG, *Mulhouse*.—For excellent printed cottons, and for fine designs.  
 45A JAFUIS, HASTNER, & CASTERON.—For very good printed cotton.

## ZOLLVEREIN.

- 53 MARTIN & KUHLES, *Rheydt, R. P.*—For excellent cotton fabrics, lamas.  
 54 BORNHOFELD, W. *Gladbach, R. P.*—For good cotton canvas.  
 55 KNABE, E. B. *Plauen*.—For window curtains and gauzes, and for designs of good taste.  
 72 WOLFF, SCHLAFHORST, & BRUEL, *Gladbach, R. P.*—For very good and cheap cotton stuff, dyed and printed, for trousers.

## HONOURABLE MENTION.

## UNITED KINGDOM.

- 374 SHANKS, W. & SONS, *Bridge of Weir, near Paisley, N. B.*—For good thread and twisted yarns.

## INDIA.

- 674 INDIA MUSEUM, *Whitehall yard, London, S. W.*—For good cotton counterpane.

## AFRICA, WEST.

- 4 BOWERBANK, J. B. *Cameroons*.—For good grass cloth bag.

## LIBERIA.

- 2 RALSTON, G. Consul-General for Liberia, 18 *Tokenhouse yard, London*.—For very large cotton cloths.

## SIAM.

- 19 SIMMONDS, P. L. 3 *Winchester st. London, S. W.*—For good cotton cloth.

## SECTION XII.—WOOLLEN AND WORSTED.

## LIST OF JURY AWARDS.

## MEDAL.

## UNITED KINGDOM.

- 381 CLIBBORN, T. & J.  *Newtown Factory, Moate*.—Tweeds and Meltons; for general excellence in manufacture and styles.  
 383 HOOPER, C. & Co. *Eastington Mills, near Stonehouse, Gloucestershire*.—For great excellence and beauty of make, in their elastic goods especially.

- 386 HILL & HUGHES, *Blue Bell, Inchicore, Dublin*.—Irish frieze; for excellence of fabric and finish.

- 391 SCOTT, F. & R. & Co. *Island-bridge Mills, Dublin*.—For sound, useful goods, well adapted for general use.

- 392 WISE & LEONARD, *Nailsworth and Holcome Mills, near Stroud, Gloucestershire*.—For excellence of make and beauty of finish.

- 393 HARRISON, G. & Co. 31 *North Bridge, Edinburgh*.—For great excellence and good taste in Scotch Tweeds.

- 394 IRWIN, E. 30 *Albion st. Leeds*.—For sound, honest, serviceable goods, well adapted for the home trade.

- 396 MAHONY, M. & BROS 3 *Camden quay, Cork, and Blarney Factory, co. Cork*.—For useful and highly creditable goods.

- 398 LAING & IRVINE, *Hawick, N. B.*—For choice styles and excellent fabrics.

- 400 HUNT & WINTERBOTHAM, *Cam and Dursley Mills, Gloucestershire*.—West of England cloths; for superior quality, finish, and colour.

- 402 ROBERTS, JOWLINGS, & Co. *Lightpill Mills, Stroud, Gloucestershire*.—For creditable, useful, and serviceable goods.

## CANADA.

- 23 ROBERTSON & Co. *Montreal*.—For goods most creditable to the colony.

## BELGIUM.

- 90 GAROT, J. *Ferviers*.—For beautiful quality and good colours.

## FRANCE.

- 46 ARBECKX-COLLETTE, *Tourcoing (Nord)*.—Worsted yarn—For great excellence in manufacture.

## NETHERLANDS.

- 40 ZAALBERG & ZOON, J. C. *Leyden*.—Blankets; for excellence of quality.

## ZOLLVEREIN.

- 100 LOCHNER, T. FR. *Aachen, R. P.*—For exceedingly well made goods, nicely finished, and of superior dye.

## HONOURABLE MENTION.

## VICTORIA.

- 109 CHAMP, COLONEL, *Pentridge*.—For blankets and rugs, creditable to the colony.

## SECTION XIII.—SILK AND VELVET.

## LIST OF AWARDS.

## MEDAL.

## UNITED KINGDOM.

- 403 TAYLOR S. & STOKES, 45 *Friday st. London, E. C.*—For real merit in silver shot, brocade, and plain moiré antique, and for excellence in manufacture.

- 405 SLATER, BUCKINGHAM, & Co. 35 *Wood st. London, E. C.*—For excellence in design and manufacture in scarfs, ties, and handkerchiefs.

## FRANCE.

- 47 BONNET, *Lyons*.—For excellence of manufacture in black silk fabrics.

- 48 BRUNET-LECOMTE, *Lyons*.—For elegance of design, and excellence of manufacture in broché, chiné, moiré, and grenadines.

- 49 BLACHE, *Lyons*.—For quality and beauty of colour in plain silk and terry velvets.

**50 BERTRAUX, RADOU, & Co. Paris.**—For excellence of design and superiority of work in embroidery on silk.

**51 COCHETEUX, SON, & Co. Templeuve.**—For excellence of design and manufacture in their silk and wool mixture for furniture.

**52 MILLION, Lyons.**—For excellence of quality and colour in plain glacé silk.

**53 PILLET-MEAUXÉ and SON, Tours.**—For elegance in design, beauty of colour, and high excellence of manufacture in silks for furniture.

**55 BOUILLET, J. B. Paris.**—For good design and workmanship in embroidery on silk and velvet.

**56 YEMENIZ, Lyons.**—For superiority of colour and manufacture in furniture and vestment silks.

**58 JOSEPHAND, FEYROL & Co. Lyons.**—For elegance of design and excellence of manufacture in broché, grenadine, and mousseline de soie.

#### ITALY.

**201 PIZZETTI, F. Parma.**—For raw silks.

**200 ABBATI, PIETRO, Parma.**—For raw silks.

**201 BANCALARI, ETTORÉ, Chiavari (Genoa).**—For raw silks.

**202 CERESA BROS. Piacenza.**—For raw silks.

**203 CIMBARDI, ALESSANDRO, 9 Piazza del Carmine, Milan.**—For excellence in spinning of sewing silk.

**205 DE FERRARI, T. G. B. Genoa.**—For excellence of quality and manufacture in black and coloured silk velvet.

**206 DE VECCHI, PASQUALE & Co. 2 via Monte Pietà, Milan.**—For raw silks.

**207 DELPRINO, MICHELE, Vesime (Alexandria).**—For raw silks.

**208 GIOVANELLI, AMATO, Pesaro.**—For raw silks.

**300 KELLER, C. A. Villanovetta, near Saluzzo.**—For raw silks.

**302 LAZZARONI, PIETRO, Piazzadi S. Sepolero, Milan.**—For raw silks.

**303 MODENA, BROS.**—Reggio in the Emilia.—For raw silks.

**305 RONCHETTI, BROS. Sala and Civate (Como).**—For raw silks.

**306 ROTA, ANTONIO, Chiari, Brescia.**—For raw silks.

**308 VECCHI-JODI, Reggio in the Emilia.**—For raw silks.

#### ZOLLVEREIN.

**56 KLEMM & Co. Crefeld, R. P.**—For excellence of design and workmanship in their stamped and cut velvet ribbons.

**57 DIEKGARDT, F. Viersen, R. P.**—For good manufacture and cheapness in piece velvets, coloured velvet and ribbons.

#### HONOURABLE MENTION.

#### UNITED KINGDOM.

**404 CHADWICK, J. 12A Moseley st. Manchester, and West Houghton, Lancashire.**—For power loom, glacé, ordinary, shot, and figured silks.

#### ITALY.

**301 LANZANI, LUIGI, BROS. 9 via del Morello, Milan.**—For spinning from waste silk.

**307 SICCARDI, LORENZO.**—For raw silk.

### SECTION XIV.—MANUFACTURES FROM FLAX AND HEMP.

#### South Gallery and Nave.

THE linen manufacture, which was substituted for the woollen, after flourishing for many years, chiefly in Ulster, has greatly revived in consequence of the application of machinery to the spinning of yarn and of the introduction of the power-loom in weaving.

The exports of linen yarns and linen manufactures from Ireland to Great Britain and foreign countries was, in 1862, £6,292,000; in 1863, £8,084,000; and in 1864, £10,327,000. The number of spindles in operation for spinning flax in Ireland in 1864, was 761,060; 200,000 persons are altogether employed in connexion with the trade, and the amount invested in buildings, machinery, and the requisite floating capital, is estimated at £3,000,000. In 1864 there were 42 factories, with 8,187 power-looms, nearly the whole of which were employed.

The estimated quantity of flax grown in Ireland in the seven years ending 1864 was 216,897 tons; or on an average, 30,985 tons per annum. The number of acres sown in 1803 was 214,099; and in 1864, 301,693 acres—an increase of 87,594 acres, chiefly in Ulster. The produce of the two years in dressed material ready for spinning was 139,712 tons. The import of foreign flax into the United Kingdom in those years was 164,416 tons, so that the quantity consumed in the manufacture of linen cloth exceeded the entire produce of the whole of Ireland. There will, therefore, be a ready market for twice the quantity of flax grown last year, supposing the machinery then existing to remain the same. But in fact the manufacture of linen is progressing with unexampled rapidity. Mr. Baker gave the number of spindles working in Ireland in May, 1864, as 665,442, but at the close of 1864 this number had increased to 761,060. These, with the English and Scotch mills, would demand 152,550 tons of dressed flax, or a quantity fully equal to the home production and imports from abroad in 1864. In foreign countries, too, flax spinning has increased 426 per cent. in ten years, and is still more rapidly progressing. It is evident from the figures that if Ireland produced three times the quantity of flax grown in 1864 there would be ready sale for it for home consumption and exportation.

The produce of the last flax crop was, in general, abundant in quantity, but deficient in quality. The Irish flax inspectors attribute this to "late sowing," "insufficient preparation of soil," and "want of care in weeding the crop." The English inspectors to monetary

difficulties and an unfavourable season. We trust the opinion is unfounded that there will be a deficiency equal to one-third in the number of acres under flax in 1865.

The government have determined to continue the grant for paid instructors to diffuse information in various quarters on the best mode of culture, &c. From the report on the statistics of flax culture in Connaught and Munster in 1865, by W. Neilson Hancock, LL.D., it is proved that the decline which took place in the production of flax in Ulster in 1865 compared with 1864 was not peculiar to that year. In the last sixteen years there was a decrease in acreage in seven years at different times, and an increase in nine years; but on the whole the growth of flax increased from 60,314 acres in 1849, to 251,534 in 1865, being an increase of over 300 per cent. in sixteen years. The increase in the growth of flax in Connaught, from 1861 to 1863, when no government aid was granted, was only 986 acres, but in 1864, with government aid, the increase was 6,110 acres. There was a decrease of 13 per cent. in 1865; but the crop, if compared with that of 1861, shows an increase of 264 per cent.

Similarly in Munster, from 1861 to 1863, when no government aid was given, the whole increase was only 908 acres, but with government aid, in 1864, the increase was 2,398 acres. Although there was a diminution of flax culture in Ireland in 1865, as compared with 1864, the statistics prove that the government encouragement has worked most successfully, and that its assistance may be expected to be advantageous.

The greatest exertions are being made to extend the cultivation of flax in England, but the Irish farmer has only to sow early, to prepare his ground carefully, and to give the crop ordinary care to secure ample remuneration. The farmer whose expectations were not fully answered last year should hope for a more favourable result next year. He does not abandon the culture of any other crop because it may not have fulfilled his hopes in one year. In general, all the flax grown in Ireland has been sold at prices which yielded to the farmer a larger profit than he could have obtained from any other crop, and this ought to be a sufficient encouragement for the cultivation of the crop.

The flax plant and the linen manufacture are two sources of almost unlimited prosperity. Ireland has an opportunity of becoming the great flax market of Europe. With plain ordinary care the crop may be grown and pulled in excellent condition. Mills for dressing flax and preparing it for the mill, have been erected in many counties which last year produced flax on an extensive scale for the first time. There is no true reason for supposing that cotton will ever again be so cheap as to render the culture of flax in Ireland unremunerative.

Considerable progress has been made in the linen trade since 1851. Finer yarns have been made than were ever made before, and machinery is being more introduced every year. In 1851 the finest yarns were 760 leas; in 1862 1,000 leas were produced. The former grist is 130 miles to the pound of flax, and the latter 170. The great desideratum is yet to be gained for linen as a competitor with cotton—namely, a more full adoption of machinery, to the consequent lessening of price and increase of quantity, so as to bring linen goods more into use in domestic and other arrangements in which textiles are employed. Whatever may be the changes undergone in this cotton crisis in the relative value of linen and cotton goods, provided flax is grown extensively, and machinery introduced as fully in flax as it is in cotton (and this is practicable), the end will be that each will find its natural price, and both be used extensively.

There is no reason to suppose that flax could ever supplant cotton. Any efforts, therefore, to raise a flax-growing or linen-wearing or manufacturing mania is to be avoided, and ought to be discountenanced. So long as cotton ruled from 5d. to 9d. per lb. (mean 7d.), linen manufacturers, who have had a good deal to contend with as to supply of raw material, did not feel justified in buying expensive machinery to put linens in competition with calicoes. But now that there is no reasonable prospect of cotton ruling below 10d. to 14d. (mean 12d.), and that flax may be sold at £55 to £75 per ton of 2,240 lbs. (mean £65), there is no reason for further delay in any necessary outlay for the purpose of raising the linen trade to its natural position.

The sets of linen most likely to displace calicoes are from 800 to 1500 (light) and from 1000 to 1600 (strong). Those coarser or finer will not be greatly affected, whether people take to linen more and cotton less, or not. Tablecloths, diapers, shirtings, and handkerchiefs, have a trade on their merits; and the only way these can be affected by cotton goods is that the price of cotton will be too high to justify attempts to supplant linen goods of those kinds. Flax and cotton may also come in contact in drills, ducks, brown hollands, blacks, and other dyed goods; and especially for hot climates linen goods might be made so cheap as to give a very decided preference, and secure a very large sale.

The variety of the fabrics made from flax is really surprising. In the stand of Messrs. Dunbar, Dickson, and Co., of Belfast, were samples of flax, dressed and undressed, of linen yarn and thread of strong brown and bleached linens, of handkerchiefs which exhibited remarkable finish and design, and of splendid diapers of the fern leaf pattern. Above the cases, which contained this fine collection, were pictures of their factories in Gilford, county Down, and

Ballymoney, in the county Antrim, which may remind the frequent traveller of the surprise with which, interrupted in his doze, he looked out of the railway carriage in the Summer night and saw snowy fields, so vast is the area over which bleaching linens hide the grass. Equally fine, but in some respects different, was the collection contained in the case of Charley and Co., also of Belfast. Here was illustrated the possibility of imitating cotton fabrics in linen. Several splendid diapers show the number of patterns which can be suitably applied by the designer, and two fine pieces of lawn may be safely compared with the softest and whitest cambric. The different decorations of each piece would, to the experienced eye, indicate sufficiently the market for which it was intended. One goes to France, another to the West Indies, another to South America, and the taste of the purchasers is variously shown in the devices which ornament the glazed paper which binds the fabric, and the colour and outline of the print it bears. The great firm of Richardson and Owden, of Donegal-place, Belfast, had a large stand tastefully furnished with shirting and fronting linen, with bird's-eye diapers and splendid brown damasks. Notable in this collection were the fine stitched and woven fronts. At first sight it could scarcely be credited that the latter were produced in the loom, so closely do they imitate the best needlework. The decorations and quality of the damasks were particularly fine, and even in the small articles—doyleys—an amount of taste and ingenuity is displayed exceedingly creditable to the firm. The stand of Jaffé Brothers, of Banford Bleach Works, county Down, was no less attractive. The history of this firm is a remarkable instance of enterprise and perseverance. Its founder, starting on the Continent as a small dealer in linens and calicoes, gradually made his way to the establishment of factories in Belgium and Hanover, and when well established in trade, changed his head-quarters to Belfast, and placed his extensive works in Banford. The white handkerchiefs in the case, alternated with printed handkerchiefs, exhibited the utmost fertility of design and cultivation of taste. Messrs. Johnstone and Carlisle, of Brookfield, near the northern capital, take a still wider ground. Specimens of flax in the straw, scutched and hackled, occupy one corner. Yarns of flax and tow puzzle the uninitiated to tell which is produced from the good material and which from the refuse. The work of the hand-looms contrasts with that which steam power has helped to produce. Unbleached and bleached Irish cambric show the change which simple exposure to the open air on the surface of green fields can produce. Some handkerchiefs displayed were worth from 2s. 6d. to 3s. each, at wholesale price: while on the stand of another exhibitor one might see linen handkerchiefs which can be produced at thirteen pence per dozen.

The stand of Messrs. Finlayson and Bousfield, of Johnstone flax mills, near Glasgow, shows a different branch of the flax manufacture. Their large case was filled with samples of linen threads in every colour—and shade of colour—dark puce, light blue, rich crimson, deep brown, and showy yellow, a variety exhibiting the vast improvement which chemical science has of late years introduced into the art of dyeing. Our ancestors of a hundred years back were obliged to content themselves in the adornment of their persons with the primary colours and their simple modifications, or with sober neutral tints. Modern tastes will not content themselves with prismatic hues, and seek richer and more delicate tones than appeared in the fabrics of fifty years ago. The threads manufactured by the Messrs. Finlayson extend from the coarsest to the finest quality. They are intended for sempstresses, tailors, and shoemakers, and are sold at a singularly low price. Linen threads were in use many years ago, until supplanted by the cheaper and softer cotton. The effect of the American war has been to bring them into use again, and accordingly to augment very considerably the prosperity of the Johnstone mills. No one is better known in Ireland in connexion with the flax trade than Mr. Charles Finlayson, and he is not only an extensive buyer and large employer, but a high authority on all that concerns the culture of flax and the treatment of the fibre. His mills, near Glasgow, have certainly assisted in showing the capabilities of flax. There was no neater stand in the south gallery than his, and there is abundant reason to be satisfied with the award which gave a medal for the excellent samples of threads of all kinds and colours there exhibited. On an adjacent stand Messrs. Fenton, Son, and Co., of Belfast, exhibited flax in the raw state and in the different processes—yarns, damask table-cloths, and Indian scarfs of beautiful and showy patterns. Messrs. Moore and Weinberg, of the same town, exhibited linen yarns and damask table-linens very fine and white; and Messrs. Walpole and Geoghegan, of Suffolk-street, Dublin, had a very fine assortment of damasks, diapers, and towellings. There were only two representatives of the Drogheda trade in the Exhibition. The trade is quite distinct from that of Belfast, and competes successfully against Scotch linens. There are above a thousand hand-looms in Drogheda, and each of these may be said to support three persons; but the process of manufacture is not confined to weaving, and in many other departments a great number of intelligent operatives find remunerative work. The goods produced are of the coarser and stronger quality, and of course do not employ much decorative skill, but there is a good deal of ingenuity displayed in the close adaptation of each fabric to its proper uses, and the stout

dowlas and the rough huckaback admit of many different patterns. The firm of Owen and Sons showed different kinds of tow and flax yarn, a number of cheap and strong handkerchiefs, excellent brown holland, stiff drill, suitable to the clothing of artizans and agricultural labourers; and strong linen, which can now be sold cheaper than grey calico, and serves the same uses.

Mr. Henry Hull has a pre-eminence in the class of goods which come under the head of sheetings, and several fine pieces of diaper shown by him would bear comparison with any exhibited elsewhere.

Of the Scotch exhibitors of coarse goods, the principal were Fleming and Co., of Glasgow, who showed jute yarns, sacking, Hessians, and tarpaulin; and Salmond and Co., of Arbroath, who exhibited navy canvas of various kinds, and flax twine for roping or seaming.

**411 AUSTIN, J. 8 & 9 Princes st. Finsbury, London, E.C.**—Imperial patent sash, blind, curtain, picture, and clock lines.

**412 FINLAYSON, BOUSFIELD, & Co. Johnstone Flax Mills, Glasgow.**—Flax in different stages of manufacture; shoe and tailor's threads coloured and bleached; gilling twines, &c.

**413 FLEMING, W. & J. & Co. Baltic and Clyde Linen Works, Glasgow.**—Jute yarns, sacking, pocketing, Hessians, tarpaulin, sacks, wool packs, guano bags, &c.

**414 JAFFÉ BROTHERS, Donegal sq. South, Belfast, and Banford Bleach Work Co. Gilford, co. Down.**—Fine and domestic linens; linen and cambric handkerchiefs; turbans manufactured for the Moslems of Africa and Asia; damask table linen.

**415 JOHNSTON & CARLISLE, Brookfield Mills, Belfast.**—Irish flax; linen yarns; hand-loom and power-loom linens; cambric handkerchiefs; plain cambric; lawns, diapers, damasks, huckaback, &c.

Of late years the profits on the strong and medium linens, or handkerchiefs, drills, damasks, and other goods made in Ireland, have been so large as to attract notice, and in some measure to stir up persons hitherto outside the trade to make efforts to get into it; but had the scutching tow, which up to a year or two ago was largely used for fuel, been economized, and sackings, canvas, and sailcloths been made a branch of the trade in Ireland, the great success lately achieved would have been enjoyed long ago, and the staple trade of Ulster would have spread itself into every county in the provinces.

The number of scutching mills in Ireland was as follows:—

	1861.			1865.
Ulster, -	1,013	-	-	1,314
Leinster,	13	-	-	44
Munster,	7	-	-	42
Connaught,	4	-	-	26

Total, 1,013 - - - 1,426

**416 SALMOND, W. & SONS, Arbroath, Scotland.**—Navy canvas, and flax canvas of various kinds; tow-milled canvas; flax seaming and roping twine.

**417 VERDON, MAGUIRE, & Co. 2 Burgh quay, Dublin.**—Ropes, sailcloth, ships' flags, and nets.

**418 WILSON, BROTHERS, 29, Lowther st. Whitehaven.**—Sail cloth with strong centre bands, from Irish flax.

**419 DUNBAR, DICKSON, & Co. DUNBAR, M'MASTER & Co. Gilford and Belfast.**—Flax dressed and undressed; linen yarns and threads; yarns, damasks, and drills; cambric handkerchiefs.

**420 FENTON, SON, & Co. Linen Hall, Belfast.**—Flax in the raw state and in its different processes; yarns; damask table cloths; handkerchiefs; lawn; Indian scarfs, &c.

**421 SWABE, F. 9 Hunter st. Brunswick square, London.**—Flax, Irish and foreign, in every state of preparation.—(*Agricultural Hall, Kildare st.*)

Ireland could be made to produce profitably to the farmer seven times as much flax as is now raised, and might thereby become the means of enabling flax-spinners to expand a trade which, though it has grown much since 1851, is never likely to assume its natural proportions till Ireland's broad acres, to the extent of one million at least per annum, are covered with flax.

To raise the yield to this extent would give occasion for the introduction of at least 100 or 150 more spinning mills, whose produce would necessitate the use of power-looms in every branch. Even in case of such extension, food would be still cheaper in Ireland than in England; for the advantage of nearness to the corn-growing and cattle-feeding States of America, and, in fact, to every country in the world whose trade is worth notice, would be greatly in favour of cheaper living in Ireland, consequently of lower wages. In fish alone there would be a large saving; house-rents are also cheaper. The difference in wages, being therefore founded on an abiding basis, is never likely to be disturbed by any possible change—W. G. CHORY.

**422 HULL, H. & Co. Drogheda.**—Sheetings, Drogheda linen, diapers, huckabacks, glass cloths, bed-ticks, farmer's drills, &c.

**423 MOORE & WEINBERG, Belfast.**—Linens, linen yarns, damask table linen.

**424 STUART, J. & W. Musselburg, Scotland.**—Patent mackerel, herring, and other fishing nets, and twines in cotton and hemp.

**425 WALPOLE & GEOGHEGAN, 8 and 9 Suffolk st. Dublin, and 43A Pall Mall, London.**—Irish damask, table linen, sheetings, towellings, &c., &c.

**426 EWART, W. & SONS, Belfast and Manchester.**—Yarns, linens, shirtings.

**427 OWEN, W. & SONS, Drogheda.**—Linens, sheetings, diapers.

**428 RICHARDSON J. SONS, & OWDEN, Belfast.**—Linens and damasks.

**429 OLDHAM & SONS, Westmoreland st. Dublin.**—Linens, damasks, sheetings.

**430 BROWN & LIDDELL, Belfast.**—Damasks and linens.

**431 MOSS, S. S. Mill st. Balbriggan, co. Dublin.**—Dowlas; checks; gingham; glass cloths; holland.

## LIST OF JURY AWARDS. MEDAL.

### UNITED KINGDOM.

**411 AUSTIN, J. 8 & 9 Prince's st. Finsbury, London, E.C.**—For patent sash and clock lines.

**412 FINLAYSON, BOUSFIELD, & Co. Johnstone Flax Mills, Glasgow.**—For shoe and tailor's threads.

**413 FLEMING, W. & J. & Co. Baltic and Clyde Linen Works, Glasgow.**—For jute manufactures.

**414 JAFFÉ, BROS. Donegal sq. South, Belfast, and Banford Bleach Work Co. Gilford, co. Down.**—For linens and turban cloths.

**415 JOHNSTON & CARLISLE, Brookfield Mills, Belfast.**—For yarns.

**416 SALMOND, W. & SONS, Arbroath, Scotland.**—For canvas.

**417 VERDON, MAGUIRE, & Co. 2 Burgh quay, Dublin.**—For ropes.

**419 DUNBAR, DICKSON, & Co., DUNBAR, M'MASTER, & Co. Gilford & Belfast.**—For linens, damasks, and threads.

**420 FENTON, SON, & Co. Linen Hall, Belfast.**—For linens.

**422 HULL, H. & Co. Drogheda.**—For brown linen goods.

423 MOORE & WEINBERG, *Belfast*.—For bleach of linen goods.

424 STUART, J. & W. *Musselburgh, Scotland*.—For fine nets.

426 EWART, W. & SONS, *Belfast and Manchester*.—For yarns and linens.

427 OWEN, W. & SONS, *Drogheda*.—For linen hucks and ticks.

428 RICHARDSON, J. SONS, & OWDEN, *Belfast*.—For linens.

430 BROWN & LIDDELL, *Belfast*.—For damasks.

#### AUSTRIA.

21 PICK, J. D. *Nachod, Bohemia*.—For linen, bleached.

#### BELGIUM.

91 DE BRANDT, J. *Alost, East Flanders*.—For fine damask and design.

95 VAN DAMME, BROS. *Roulers*.—For blouse linens.

97 VAN HAEKEN, J. A. *Zele, East Flanders*.—For cordage.

#### FRANCE.

59 GUINET, H. & Co. *Paris and Belfast*.—For printed linens.

#### ZOLLVEREIN.

58 STOLTENBURG, E. *Stralsund, Prussia*.—For hand-spun damask cloth.

75 WIDEMANN, G. *Gladbach, R.P.*—For ecclesiastical linen vestments.

#### HONOURABLE MENTION.

#### UNITED KINGDOM.

418 WILSON BROTHERS, 29 *Louthier st. Whitehaven*.—For sail cloth.

425 WALPOLE & GREGG, 8 and 9 *Suffolk st. Dublin, and 43A Pall Mall, London, S.W.*—For good collection of Irish damask, table linen, &c.

429 OLDHAM & SONS, *Westmoreland st. Dublin*.—For good collection of linens, damasks, &c.

431 MOSS, S. S. *Mill st. Balbriggan, co. Dublin*.—For power-loom linens.

#### MAURITIUS.

32 INDIAN ORPHANS, *Government Asylum*.—For ropes.

#### NEW ZEALAND.

2 SIMMONDS, P. L. 8 *Winchester st. London, S.W.*—For Maori cloak.

#### BELGIUM.

94 STEENACKERS, C. *Turnhout*.—For linen, coloured.

96 VAN DE WYNCKELE, BROS. & ALSBERGE, *Ghent*.—For bleached yarn.

#### NETHERLANDS.

42 STOFF & ROOYAKERS, *Eindhoven*.—For linen.

### SECTION XV.—MIXED FABRICS AND SHAWLS.

#### South Gallery of Nave.

THE silk trade in Ireland is almost exclusively confined to tabinets. This manufacture would be less worthy of notice (being of small extent) were it not made much of, and patronized by distinguished personages. It is said that the peculiar skill of Irish poplin weavers has kept this branch in the country; but the truth is, it was too small a manufacture to be contended for by competition, and too precarious to be much counted upon, except by a people easily flattered that they had still one great manufacture, because Ireland bears the palm for tabinets. Like all small special trades, this one affords greater opportunities than trades of larger extent for the rapid acquisition of fortunes. There can be no doubt that the sale of tabinets has been dependent upon a precarious demand, and that on fashion.—W. G. CROFT.

Attention may be specially directed to the exquisite poplins of Messrs. Fry and Co., of Westmoreland-street. In colouring, lustre, fineness, and flexibility, these goods are unsurpassed, and the firm deserves the highest credit for the care shown in the selection of patterns. Messrs. Fim Brothers, and Co. did not exhibit such expensive poplins, but they have a speciality for the manufacture of tartans and plain tabinets, and it must be remembered to their honour, that they were the first to create an extensive foreign trade in this department, and that they give more employment to weavers than any other establishment in Dublin.

397 AKBOLD & SON, *Halifax*.—Orleans lastings; worsted damask stuffs.—(Nare.)

432 SMITH, R. & SON, *Park Vale and Hayford Mills, Stirling*.—Winceya, fancy dresses, and petticoatings.

433 SMITH, G. & A. 108 *South Bridge st. Edin-*

*burgh*.—Filled shawls and plaids; tartans, woollens, mixed fabrics.

434 KERR, SCOTT, & KILNER, 58 *Cannon st. West, London, E.C.*—Shawls.—(Nare.)

435 FRY & Co. 31 *Westmoreland st. Dublin*.—Irish poplins, &c.; silk figured terrys, and borders for upholstery.—(Nare.)

The poplin trade, as every one knows, is peculiar to Ireland. Those rich and beautiful fabrics, which wear as well as the strongest cloth, which admit of greater variety of pattern, perfection of finish, and splendour of colouring than the most expensive silk, have never been successfully manufactured in other countries. For nearly a century and a half the firm with which the Messrs. Fry are connected has been in existence under the same name. It began humbly enough, but has prospered wonderfully, and now holds one of the highest places amongst the mercantile community of Dublin. It is known throughout England and America, and in many parts of the Continent, where poplins and tabinets of Irish manufacture are more highly prized than any other materials used in the dresses of ladies. Some singularly beautiful designs and colours have recently been introduced by the Messrs. Fry, and as evidence of their ingenuity and enterprise may be mentioned an exquisite black poplin made as a train for Lady Wodehouse, and ornamented with crystals of snow brocaded in silver. The particles of snow when viewed through a microscope resolve themselves into figures of extreme beauty, and the effect of using these figures largely magnified upon a black ground has been very greatly admired in this unique piece of poplin. Another most attractive fabric, of an entirely novel make, and of the

beautiful tint known as *vert de nuit*, was prepared for the Lady Mayoress, in 1866. Large purchases of white and other poplin, were lately made by the Countess Waldegrave, and the Irish material seems likely to regain the favour with which it was regarded by fashionable circles some few years ago. Not that it has ever gone out of use, but that for a while it was not so largely used as formerly in the choicer kind of dresses. Another most important manufacture is that of plain and figured poplins for window curtains and upholstery. The patterns are all designed in Dublin, and orders are obtained from the first upholsterers in England and Scotland. In this, as in several other branches of their trade, the Messrs. Fry compete successfully with the English and French markets, although the latter are celebrated for their window hangings.

The Messrs. Fry at present use as their factory a large building in Kevin-street, opposite to the police barrack, and once the town residence of the well known family of Cooper, of Markree Castle.

In this there are many rooms set apart for different branches and processes of manufacture, but as the demand for Irish poplins is becoming greater it has been found necessary to erect a new house at the eastern wing. This, when complete, will give accommodation to about forty additional looms, thus making a total of one hundred and twenty at work on the premises. Even now about three hundred persons are employed in the various departments of labour connected with weaving. Every one ought to know that the materials of tabinet are silk and worsted, the former for the warp and the latter for the weft. Entering the factory of the Messrs. Fry, one first sees a large lower room in which the dyed silk is stored. All shades of colour may be used with silks, and the price varies according to the dye, the richer shades of blue and green being very expensive. About 45s. is the average price per pound, and as a pound and a half will be used in the manufacture of the material for a dress—fifteen yards—it will easily be understood that when the cost of labour and machinery is added, the profits cannot be very great. The first process is winding, performed by girls, the second is warping, which requires considerable care and skill, as about 1,600 threads are required for a warp, and the dropping of even one would destroy a whole piece. The looms are in another part of the building. To the inexperienced stranger the most curious parts of these machines are the perforated cards which regulate the pattern with the most absolute certainty, although the manner in which they do so is very difficult of explanation. Steam power cannot be used for making poplins. It was tried in England but utterly failed, and the reason appears to be that it works too quickly, and with too much strength, to permit the harmonious combination of materials so different in respect of elasticity and tenacity as worsted and silk. The worsted employed is of that very fine material known as *Jenappe*. The workmen for the most part have fly-shuttles, which are only a little slower in the hands of an expert operative than those worked by steam. It is scarcely possible to convey an adequate idea of the extreme ingenuity and taste manifested in the production of the finer class of goods. None of the cheaper poplins, or of the commoner patterns, are made in Kevin-street, the object being rather to raise the fabric in value, and in beauty, than to degrade it to common uses. Accordingly, there is not a single Court in Europe where the name of this firm is not constantly associated with the most elegant and becoming costume. Their work, in every sense of the word, deserves to be described as art manufacture, not only for the rareness and splendour of the tints, and the costliness of the material, but for the novelty and attractiveness of the designs, which are produced by gentlemen of the highest ability in this department.

436 PIM BROTHERS, & Co. *South Great George's st. Dublin*.—Irish poplins; brocatello curtains; shawls, &c.—(Narc.)

437 CRAVEN J. & Co. (LIMITED), 23 *Leeds road, Bradford, Yorkshire*.—Cashmere, Llana, Indiana shawls, &c., shawl cloakings, rupe, merinoes, and other woollen fabrics; dress goods.

## LIST OF JURY AWARDS. MEDAL.

### UNITED KINGDOM.

397 ARBOYD & SON, *Halifax*.—For good design and colour in worsted damasks; and for excellence of manufacture of Canton cloths and lastings.

432 SMITH, R. & SON, *Park Vale and Hayford Mills, Stirling*.—For excellence of manufacture of winceys, fancy dresses, and petticoatings.

433 SMITH, G. & A. 108 *South Bridge st. Edinburgh*.—For general merit in tartan shawls and waterproof tweed mantle.

434 KERR, SCOTT, & KILNER, 58 *Cannon st. West, London, E.C.*—For filled long shawls and tartan long shawls; highest excellence in design, colour and manufacture.

435 FRY, W. & Co. 31 *Westmoreland st. Dublin*.—For a remarkably fine collection of Irish poplins, also ilk and worsted figured terrys, in mediæval designs, beautiful in style and excellent in manufacture; also carriage linings and laces, perfectly well made.

436 PIM, BROTHERS, & Co. *South Great George's st. Dublin*.—Plain, figured, watered, and brocaded Irish poplins, well manufactured and most useful in a commercial point of view.

437 CRAVEN, J. & Co. (LIMITED), 23 *Leeds road, Bradford, Yorkshire*.—For great excellence and usefulness of all the articles, especially llama shawls and shawl cloaks; also a new fabric called Melbourne cloth in Section XV. Also for a fine illustrative collection of Colonial wool and yarns, exhibited in Section IV. in the department of *Queensland*.

### FRANCE.

61 CHANEL, *Lyons*.—Rich filled shawls, for excellence of manufacture.

64 TUVÉ & Co. *Paris*.—Timucs for millinery, for novelty of fabric.

65 GAUSSEN, Aindé, & Co. *Paris*.—For Cashmere shawls—very superior in design, finish, and quality.

66 IMBS, *Paris*.—Indian tissues, for novelty of fabric and beauty of colour.

67 LACASBAGNE, DESCHAMPE, SALAVILLE, & Co., *Paris*.—For Cashmere shawls—novelty of design and good manufacture.

68 RODIER, *Paris*.—Tissues, for novelty of manufacture and good effect.

69 DUCHE, BROS. & Co. *Paris*.—French Cashmere shawls, for the highest excellence in design, colour, and manufacture.

70 FORTIER & MAILLARD, *Paris*.—Shawls, for originality of design and goodness of texture.

### HONOURABLE MENTION.

#### AUSTRIA.

31 GIANI, J. & C., 3 *Dreilaufergasse, Vienna*.—For useful and good damasks and embroidered fabrics.

#### SWITZERLAND.

11 HESS-BRUGGER, A. *Amriswil, Thurgau*.—Knitted articles, useful and good.

#### ZOLLVEREIN.

59 MORITZ, A. *Nordhausen, Saxony*.—Mixed textile goods, useful, and of good commercial value.

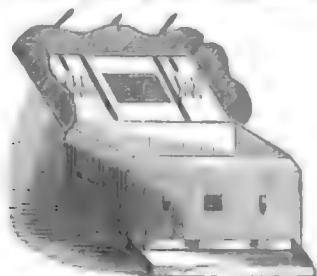
## SECTION XVI.—(A).—LEATHER, SADDLERY AND HARNESS.

## Carriage Court.

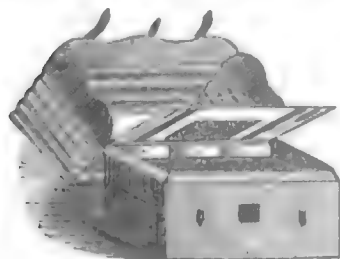
**Messrs. WILLIAM LENNAN and Sons**, whose ingenious improvements and admirable workmanship in saddlery and harness have already obtained the highest distinctions both in national and international competitions, specially prepared for the Exhibition a number of specimens of native manufacture, which tended further to increase their reputation. Nothing could be more elegant and durable than the two sets of pair-horse harness, one mounted in silver and the other in brass; or than the Stanhope harness, whose rosettes are handsomely mounted with crests and monograms. All the mountings display excellent taste, and though the style of ornament employed is of the most expensive description, there is nothing gaudy or inappropriate. The gig saddle is constructed upon a new design. Those who keep trotting horses will doubtless admire the harness which has been invented by Messrs. Lennan for their special use. It weighs something less than 8lb., being as light as the best American trotting gear, but it is far superior in style and durability. Every variety of saddle was shown, from that intended for racing, which weighs only 2lbs., to the lady's saddle, beautifully inlaid with fawn coloured doeskin, and providing the securest and most comfortable seat. Amongst the staunchest customers of this eminent Dublin firm are some of the most celebrated English jockeys, one of whom was Harry Grimshaw, who rode the winner of the two thousand guineas at Newmarket. There was a splendid assortment of hunting saddles of different weights and sizes. In all these articles the work is done by hand, thus insuring greater strength and permanency. The result of the enterprise and skill displayed by the Messrs. Lennan is that their foreign trade is constantly enlarging.

Mr. Hudson, of Dawson-street, showed saddles, double and single harness, and a very pretty and light set of American trotting harness. Mr. J. Hinkson, of Dame-street, not only chooses the best material, but employs the most competent workmen, and consequently his goods are very admirably finished, and capitally suited to their various purposes. The carriage laces and trimmings of the Messrs. Fry were well entitled to the medal which was awarded; and it would be difficult to surpass in construction, form, and finish, the carriage lamps of Mr. J. Hawkins, of Capel-street.

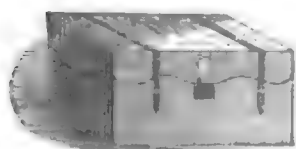
**440 MYERS, M.** 27 Wigmoré st. Cavendish square, London.—Patent waterproof dress baskets, trunks, portmanteaux.—(North Gallery and Agricultural Hall.)



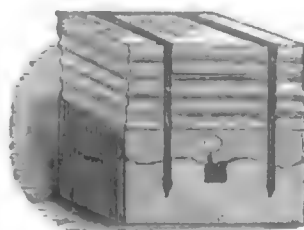
Collapsed open empty, with drawer.



Expanded open empty.



Collapsed closed packed.



Expanded closed packed.

**M. Myers's** dress-basket trunk, portmanteau, and Indian Outfitting Establishment, Cavendish House, corner of Marylebone-lane and Wigmoré-street, London, established 1807. By Her Majesty's Royal Letters Patent, No. 931. Patented April 13, 1863. The Royal Alexandra Self-Expanding Travelling Dress-Basket Trunks, fitted with compartments for bonnets, jewellery, &c., &c., specially designed for H.R.H. the Princess of Wales; adapted for marriage trousseaux, &c. For India and Continental travelling the ingenious newly-invented waterproof travelling dress basket-trunk, for which royal letters have been granted to Mr. Michael Myers, the inventor and manufacturer, is acknowledged to supersede all other dress baskets or boxes hitherto manufactured, being so constructed that it can be expanded to carry the costliest dresses in large or small quantities, in full or half-length, without creasing by folding, and by its peculiar contrivance allows of easy access to articles packed at the lower or centre part of the box without disarranging or even touching those packed at top, a desideratum hitherto unobtained in any other kind of travelling box. Being equally adapted for the conveyance of either ladies' or gentlemen's wardrobes, or both, in one box—enabling travellers to combine their luggage, and thereby avoid the usual heavy

charges of carriage on Continental and other railways, it being so light as to weigh less when filled than an ordinary empty box. At the same time being equally durable, or stronger, than any leather or wooden trunk, and being perfectly air-tight, it is impervious to damp or salt atmosphere, so that travellers to India or any part of the world may rely that the most delicate and costliest dresses can be conveyed without the slightest possibility of getting discoloured by sea-air.

Sold only at the manufactory of the inventor, M. Myers, 27 & 28A, Wigmore-street, Cavendish square, London (corner of Marylebone-lane), adjoining wholesale warehouses and manufactories, 67, 68, 69, & 70, Marylebone-lane, containing extensive show-rooms for every description of trunks, portmanteaus, tin cases, traveller's baths, deers and cash boxes, leather and carpet bags, and every other article adapted for travelling purposes.

M. Myers most respectfully cautions the nobility and gentry against imitation. None are genuine unless stamped "M. Myers' Patent." All infringements will be proceeded against.

**441 BLACKWELL, S.** 259 Oxford st. London.—Gutta percha jockies; anti-crib biting strap; patent springs, and vulcanized rubber apparatus for horses' legs, &c.; boots, bridles, reins, chains, whips, &c.; patent appliances for saddlery.

**443 GRAY, W. & SON, 13 South St. David st. Edinburgh.**—Hunting and side saddles; single horse gig or car harness.

**444 HUDSON, S.** 65 Dawson st. Dublin.—Saddles; double and single harness; "American" trotting harness; safety stirrups and spring "third crutch" for ladies' saddles; horse-breaking and training apparatus; horse clothing and stable requisites.

**445 LENNAN, W.** 29 Dawson st. Dublin.—Phaeton and brougham harness of various kinds; trotting harness; ladies and gentlemen's, and hunting saddles; bridles, stable collars, &c.; safety stirrups for ladies and gentlemen.

**446 LLOYD, T.** 16 Newcastle st Strand, London, W.C.—Parchment, vellum, and linen luggage labels.—(North Corridor.)

**447 M'MULLEN, B.** 54 Dawson st. Dublin.—Two horse and single horse harness; ladies and gentlemen's saddles; racing saddles; whips, bits, stable brushes, horse clothing.

**448 PARKER, W. S.** 37 Back lane, Dublin.—Hides.—(North Corridor.)

**449 TRAWFORD, C.** 1 Essex quay, Dublin.—Two single horse harnesses; dog collars; ladies' bridles; whips, bits, rein-holders, &c.

**450 COOPER, M.** 2 and 3 Railway st. York.—Saddlery.

**451 JOHNSON, S. & B.** Ballina, co. Mayo.—Saddlery, harness, spring stirrup slides.

**452 HAYES, BROTHERS,** New row, south, Dublin.—Hides.—(North Corridor.)

**453 HINCKSON, J.** 76 Dame st. Dublin.—Saddlery, harness, safety stirrups, bridles.

**454 CANNON, DUNN, & KELLY,** 52 Watling st. Dublin.—Leather; parchment; vellum.—(North Corridor.)

**455 SWAINE & ADENEY,** 185 Piccadilly, London, W.—Whips and riding canes.

**562 CATTANACH, W.** Bankfoot, Perth.—Farm harness.

#### JURORS' REPORT.

It is pleasing to be able to refer to the department of harness and saddlery as very creditable, both as regards the skill displayed, and the quality of the materials used. It must, however, be remarked, that in most cases the leather is procured from England; the manufacturers in this have shown their judgment, in procuring what is excellent irrespective of the place of production. The workmanship in nearly all goods shown by Irish exhibitors is the production of native workmen. Not only is some of the harness and saddlery excellent of its kind, but the makers seem to be alive to the

necessity for progress. Many plans and inventions are shown to add safety and comfort to the rider as well as to the driver, and confidence to the horse.

All persons accustomed to horses must have observed that much of what is technically called vice is in reality timidity; and if, by improved processes of breaking young horses, they can gradually be accustomed to the bit and strapping, many a promising colt may be trained to become a useful and valuable animal and friend of man, instead of being rendered an ill-tempered and vicious brute, that none care to ride or drive, lest life be endangered.

Much remains to be done before harness can be considered perfect. The young saddlers and harness-makers should take opportunities of travelling, and everywhere notice the mode of harnessing horses. They would see in the south of France the breeching carried beyond the collar and attached to the pole-piece, easing the strain on horses travelling in hilly countries when descending hills. In parts of Germany they would notice the horses drawing with breast-collars; again, they would see horses at work with very serviceable and inexpensive rope harness. In Russia the horses would be noticed driven without blinkers and without traces, the shafts of the sledges and droshkys being lashed to the collars; the harness would also be noticed to be so light as to seem for show and not for use; this, however, is owing to the excellence of the preparation of the leather, it being quite double the strength of the best English harness leather. In the United States of America he would see the fast-trotting horses drawing, the light carriages used there, almost entirely by the reins. These and many other customs and systems may be noticed by those who travel to collect information, experience, and new ideas in aid of their special calling.

The artistic ornamentation of harness is another matter that merits attention. It is in this case desirable to look to the export as well as the home trade. In many foreign countries people will not use the excellent and plain style of harness preferred by English, Scotch, and Irish gentlemen; they want something that will harmonize with their brilliant vegetation, clothing, and sunshine; and it is useless to offer them harness they at once reject as not approaching their ideas of beauty.

The drawing schools of the country should here aid the manufacturer. Many years have passed since their establishment, the boys who attended the first classes have become full-grown men, and there ought to be results even in the manufacture of saddlery. In France, Italy, Spain, Russia, and other countries, richly ornamented and costly harnesses are used on occasions of state, and the men who make them are in a better position to execute such work for exportation than those who have given little or no attention to the subject. The public and merchants apply to those who are most likely to execute their orders with fidelity, taste, and accuracy, rather than let one unaccustomed to the work try experiments of which they may become the victims, while a manufacturer is learning a new branch of trade.

Much may be done in the reduction of cost by the use of ornaments produced by the electro deposit process, the copper deposit being filled with melted brass, and afterwards silvered or gilt. The invention is a French one, and deserves to be widely known. Not only are the most chaste and exquisite ornaments thus produced, but they have the finish and beauty of the best hand chasing. The system is already carried out extensively in the ornamentation of the beautiful furniture exported in such large quantities from Paris.

In singular contrast to the harness and saddlery department of the Exhibition held in Paris just ten years ago, no exhibitor of harness now shows any plan for detaching runaway horses, for which purpose so many inventions were then submitted. It seems to have become a sort of settled opinion among Englishmen that a strong pair of reins pulled by a strong arm is the safest and best plan of treatment. In the case of timid or vicious horses, a good contrivance is some

arrangement of bit or bridle to pain the mouth or impede the breathing, which can be used with horses that are known to be troublesome, and likely to cause danger.

PERCY NUGENT, *Chairman*.  
T. MAXWELL HUTTON.  
G. N. HOOPER, *Reporter*.  
A. HOLMES.  
J. W. PETERS.

#### LIST OF AWARDS. MEDAL.

##### UNITED KINGDOM.

441 BLACKWELL, S. 259 *Oxford st. London, W.*—For the useful application of vulcanized India rubber to many purposes in connexion with horses.

444 HUDSON, S. 65 *Dawson st. Dublin.*—For a good collection of saddlery and harness, showing excellent workmanship and materials.

445 LENNAN, W. 29 *Dawson st. Dublin.*—For a good collection of saddlery and harness, and for exhibiting several new and ingenious inventions.

450 COOPER, M. 2 and 3 *Railway st. York.*—For a

good collection of saddlery, showing excellent workmanship and materials.

453 HINKSON, J. 76 *Dame st. Dublin.*—For a good collection of saddlery and harness showing excellent workmanship and materials.

455 SWAINE & ADENET, 185 *Piccadilly, London, W.*—For an excellent and varied collection of plain and ornamental whips.

562 CATTANACH W. *Bankfoot, Perth.*—For his farm harness.

##### NOVA SCOTIA.

13 CHISHOLM, A. M.—For a set of harness of excellent workmanship.

##### HONOURABLE MENTION.

##### UNITED KINGDOM.

443 GRAY, W. & SON, 13 *South st. David st. Edinburgh.*—For saddlery and harness of good workmanship and materials.

447 M'MULLEN, B. 54 *Dawson st. Dublin.*—For saddlery and harness of good workmanship and materials.

451 JOHNSON, S. & B. *Ballina, co. Mayo.*—For saddlery and harness of good workmanship and materials.

### SECTION XVI.—(B).—SKINS, FURS, FEATHERS, AND HAIR.

#### South Gallery of Nave.

462 TUSBAUD, J. & F. 105 *Marylebone road, London, N.W.*—Articles illustrating patent new method of removing fur, hair, and feathers from natural skins.

463 CALLAN, Mrs. M. 2 *South Frederick st. Dublin.*—Hair chains, bracelets, rings, brooches, pins, earrings, necklets, &c.

464 PETERSON, Mrs. 37 *South Frederick st. Dublin.*—Ornaments made of hair.

465 DOHERTY, Miss, *Castle st. Sligo.*—Hair ornaments.

#### LIST OF JURY AWARDS. MEDAL.

##### UNITED KINGDOM.

448 PARKER, W. S. 37 *Back lane, Dublin.*—For superior quality of his tanned hides.

452 HAYES, BRON. *New row, South, Dublin.*—For superior quality of their tanned hides, and real excellence of their waxed kips.

454 CANNON, DUNN, & KELLY, 52 *Watling st. Dublin.*—For the good manufacture of parchment, vellum, and chamois leather.

462 TUSBAUD, J. & F. 105 *Marylebone road, London, N.W.*—For their ingenious method of removing fur, hair, and feathers from skins, making artificial felts, and saving the skin for the manufacture of leather.

463 CALLAN, Mrs. M. 2 *South Frederick st. Dublin.*—For merit in design and workmanship of hair ornaments.

464 PETERSON, Mrs. 37 *South Frederick st. Dublin.*—For merit in design and workmanship of hair ornaments.

##### CANADA.

28 CÔTE, O. *Quebec.*—For mosaic carriage furs, and for merit in dressing and manufacture.

31 BROWN & CHILDS, *Montreal.*—For real merit of assorted shoe leathers.

33 M'LAREN, J. C. *Montreal.*—For merit in the manufacture of leather pipe-hose.

##### NOVA SCOTIA.

18 COLEMAN, W. J. & SONS.—For a beautiful and well prepared collection of native furs (silver, red and cross fox, otter and mink), and various fur goods.

##### VICTORIA.

115 CLARK & SON, *Melbourne.*—For a good assortment of leathers, and for excellence of currying.

##### BELGIUM

98 ARBETZ-WUYTS, G. *Aerschot, Prov. of Brabant.*—For good boot uppers.

100 EVERAERTS, C. *Ware.*—For superior curried leather.

101 FETU & Co. *Brussels.*—For well made machine bands and leather hose.

102 HESNAULT A. & SON, *Ghent.*—For a fine collection of rabbit skins, and rabbit and hare furs, both natural and dyed.

103 LEMAISTRE & Co. *Brussels.*—For superiority in the manufacture of machine band and leather ropes.

##### FRANCE.

71 CHEILLEY, JNE. & Co. *Paris.*—For superiority of dressing of glove skins.

72 LEGROS, AING, *Paris.*—For excellence in dressing and finish of curried and varnished leather.

##### ITALY.

351 PELLERANO, GIOVANNI BATTISTA, 193 *strada Chiaja, Naples.*—For superior dressing of kid and lamb skins for gloves.

215 LOFORTE & SINISCALCO, *Messina.*—For superior dressing of kid and lamb skins for gloves.

##### NETHERLANDS.

43 DEVENTER, J. S. VAN, *Zwolle.*—For a fine collection of native skins well prepared.

44 GOMPERTZ, W. J. J. *Amsterdam.*—For varnished leather of good manufacture.



LETTS, SON, & Co. printers, stationers, and account-book makers, exhibit a series of their diaries, as well as printed account books, general stationery, and a variety of goods in leather, including despatch boxes, writing desks, purses, pocket books, &c. The publication of "Letts' Diaries" was commenced rather more than half a century ago with an issue of three sizes, selling at 1s. 2s. and 2s. 6d. each, of which the sale in the first year was about 150 copies. This has gradually and steadily increased, and at the present time upwards of 280,000 are disposed of annually, whilst the series now comprises over one hundred different forms, selling at prices ranging from six pence to six pounds each. The prize medal was awarded to this publication in 1862. The account books exhibited are made of the finest linen hand-made paper, prepared expressly for Messrs. Letts, Son, & Co., and are bound in such a manner as to combine all the advantages of the "Patent Backs" with greater durability and strength. The printed headings

are those required by "The Companies Act, 1862," for limited liability companies, for the registration of which Messrs. Letts, Son, & Co. are the city agents. To these and to the despatch boxes the prize medal has been awarded in the present Exhibition—the distinctive features of the latter being that they are manufactured to bear the heat and other trials of tropical climates. In all the leather goods exhibited, the greatest care is used to ensure *lasting strength*, a quality which few of the more ornamentally got up goods can lay claim to. The illustration (p. 268) represents the building in which, since the beginning of the new year, the above manufactures have been carried on.

483 WOGAN, C. H. 3 *Upper Sackville st. Dublin*.—Stationery, die cutting, and relief stamping; engraving, lithographic views, &c.

494 WOLFF, E. & SON, 23 *Church st. Spitalfields, London, E.C.*—Crayons and pencils; coloured chalks in cedar; solid inks and black lead.

## SECTION XVII.—(B).—PRINTING AND BOOKBINDING.

## North Corridor.

485 ASHEY & Co. 79 *King William st. London, E.C.*—Specimens of engravings for bank-notes, &c.

486 BURT, J. A. 16 *Charles st. Clarendon sq. London*.—Facsimiles, by hand, of early printing and manuscripts.—(*North Gallery of Nave*.)

487 BROOKS, V. 1 *Chandos st. Charing cross, London, W.C.*—Specimens of lithography.—(*East Corridor*.)

488 CASSELL, PETER, & GALPIN, *La Belle Sauvage yard, Ludgate hill, London, E.C.*—Printed books, and electrotypes of illustrations.—(*North Gallery*.)

489 DAY & SON, (LIMITED) *Gate st. Lincoln's-Inn fields, London, W.C.*—Lithography, chromo-lithographs, &c.—(*East Corridor*.)

490 DICKES, W. 5 *Old Fish st. Doctors' Commons, and Farringdon road, London, E.C.*—Colour printing from letter-press and machine, by the chromographic process; same in combination with steel plate printing.—(*East Corridor*.)

491 GUY, BROTHERS, 26 and 27 *Academy st. Cork*.—Stationery, bookbinding, printing, and lithography.

492 HAILES, A. C. & Co. *Peterborough court, Fleet st. London, E.C.*—Chemicographic engraving and printing; colour printing for showboards, &c.; reproductions of Exhibition prize medals; bank-note engraving and printing.—(*North Gallery*.)

493 HANHART, M. & N. 64 *Charlotte st. Fitzroy sq. London, W.C.*—Specimens of chromo lithography.—(*East Corridor*.)

494 JOHNSON, J. M. & SON, 3, 5, and 10 *Castle st. Holborn, London, E.C.* and 54 *Rue Réaumur, Paris*.—Chromo-fulgent show cards and crystal tablets.

Messrs. Johnson and Son have for many years enjoyed almost a monopoly in the printing of manufacturers' cards, and certainly an entire monopoly in those printed by their new process, for which the jurors of the London Exhibition of 1862 awarded them a medal. On the wall of one of the passages leading from the great gallery to the fine arts department, Messrs. Johnson covered a space of twenty or thirty feet in length with an immense variety of specimen cards, and any one stopping to examine them could not fail to be struck with the excellent taste displayed in the designs and colouring as well as their apparent durability and immunity from the evil effects of dust, by the process adopted by Messrs. Johnson, each card being covered with a perfectly transparent varnish or gloss.

A magnificent framed show card in glass and sparkling crystal letters was shown, besides several other variations of the art useful to be acquainted with, and produced

under Messrs. Johnson's "New Patent for Crystal Tablets," taken out in 1863. Messrs. Johnson were awarded a medal in this section "for excellence and cheapness of their coloured show cards."

496 KNIPE, J. A. *Moorville, Carlisle*.—Geological maps.—(*North Corridor*.)

497 LAYTON, C. & E. 150 *Fleet st. London, E.C.*—Specimens of engraving and stationery; proofs from engraved plates of every description; impressions from dies in wax and on paper; ornamental stationery and envelopes.—(*North Corridor*.)

498 MARTIN, T. *Newton Abbot, Devon*.—Impressions of seals engraved by machinery.—(*North Corridor*.)

499 OLIVER & BOYD, *Edinburgh*.—Educational works.—(*North Gallery*.)

500 PHILIP, G. & SON, 32 *Fleet st. London, E.C.* and *Caxton Buildings, Liverpool*.—Philip's popular atlases; series of large school-room maps; smaller school-room maps; maps for tourists, class books, &c.; Scripture prints; copy-books.—(*North Corridor*.)

501 STANFORD, E. 6 *Charing cross, London, S.W.*—Maps.—(*North Corridor*.)

502 ZAEHNEDORF, J. 30 *Brydges st. Covent Garden, London, W.C.*—Specimens of bookbinding in the monastic, Colier, Maioli, and modern styles.—(*North Gallery*.)

503 BORSCHITZKY, J. F. 32 *Tavistock place, London, W.C.*—Educational music.—(*North Corridor*.)

504 JOHNSTON, W. & A. K. 4 *St. Andrew sq. Edinburgh*.—Geological and other maps.

505 WARD, M. & Co. 5 *Dawson st. Dublin*, and 13 *Donegall place, Belfast*.—Illuminated addresses presented to H.R.H. the Prince of Wales, exhibited by permission; illuminated diploma; bookbinding; account books; heraldic engraving and die-sinking; arms, crests, monograms, residences, &c.—(*North Gallery*.)

506 WILLIAMSON, T. T. 18 *Crow st. Dublin*.—Cards engraved or lithographed; coats of arms, crests, and monograms in wax, &c.—(*North Gallery*.)

507 WORN, A. 4 *Moleworth st. Dublin*.—Die engraving, embossing, and illumination.—(*North Gallery*.)

508 FORSTER & Co. 2 *Crow st. Dublin*.—Chromo-lithographs—"Clonmacnoise," "Road and River Side," "Soldier tired," "Church (Rutland square)," &c.; copy of Chinese picture; almanacs, show-labels, &c.

509 ILLUSTRATED LONDON NEWS, 198 *Strand, London, W.C.*—Copy of Christmas supplement of 1863, and wood-blocks from which illustrations were printed; fine art and new illustrations and coloured supplements.—(*East Corridor*.)

510 GRAY, B. 33 *Richmond place, Edinburgh*.—Map of Ireland, for use of blind, raised by needle-work.

511 CALDWELL, M. 31 *South Frederick st. Dublin*.—Bookbinding.—(*North Gallery*.)

512 WISEHEART, S. & Co. 7 *Nassau st. Dublin*.—Music printing and engraving.

513 GOODALL & SONS, *Camden town, London, N.W.*—Playing cards; illuminated and relief stamping; stationery.—(*East Corridor*.)

514 HIBERNIAN BIBLE SOCIETY.—The Bible for all nations.—(*North Gallery*.)

515 M'DONNELL, J. *Old Bawn Mills, Co. Dublin*.—Paper.—(*North Gallery*.)

517 SMITH & SON, 63 *Charing Cross, London, S.W.*—Educational maps.

519 THE QUEEN'S INSTITUTE FOR THE TRAINING AND EMPLOYMENT OF EDUCATED WOMEN, 25 *Molesworth st. Dublin*.—Address to the Queen; the illumination designed and executed in water colours by Miss Jane Underwood; the writing and embroidery by pupils of the Institute, exhibited by permission of her Majesty.—(*Water Colour Room*.)

#### LIST OF AWARDS.—SECS. XVII. (A) AND XVII. (B).

##### MEDAL.

##### UNITED KINGDOM.

469 COHEN, R. S. *Magdalen row, Great Prescott st. London*.—For well-made pencils.

470 COWAN & Co. *Valleyfield, Edinburgh*.—For high-class stationery.

471 CALDWELL, BROTHERS, 15 *Waterloo place, Edinburgh*.—For well-executed specimens of steel engraving.

472 M'DONNELL, J. & Co. 8 *Lower Ormond quay, Dublin*.—For strong and well-finished writing and printing paper.

474 ROWNEY, G. & Co. 10 and 11 *Percy st. and 29 Oxford st. London, W.*—For the excellent quality of their artists' materials, and for their well-executed photographs.

477 WATERSTON, G. & SON, 56 *Hanover st. Edinburgh*.—For the good quality of their sealing-wax for hot climates.

480 GILLOTT, J. *Victoria Works, Graham st. Birmingham*.—For the excellence of his steel pens.

481 LETTA, SON, & Co. 8 *Royal Exchange, London, E.C.*—For their diaries, despatch-boxes, and account-books.

484 WOLFF, E. & SON, 23 *Church st. Spitalfields, London, E.C.*—For their crayons, pencils, and coloured chalks.

487 BROOKS, V. 1 *Chandos st. Charing Cross, London, W.C.*—For chromo-lithography.

488 CARRELL, PETER, & GALPIN, *La Belle Sauvage yard, Ludgate hill, London E.C.*—For the excellence and cheapness of their educational works and atlas.

490 DICKER, W. 5 *Old Fish st. Doctors' Commons, and Farringdon road, London, E.C.*—For chromographic printing.

492 HAILER, A. C. & Co. *Peterborough court, Fleet st. London, E.C.*—For chemiographic printing and bank-note engraving.

493 HANHART, M. & N. 64 *Charlotte st. Fitzroy sq. London, W.C.*—For chromo-lithography.

494 JOHNSON, J. M. & SONS, 3, 5, and 10 *Castle st. Holborn, London, E.C.*—For the excellence and cheapness of their coloured show cards.

500 PHILIP, G. & SON, 32 *Fleet st. London, E.C.* and *Caxton Buildings, Liverpool*.—For excellent cheap maps and atlases.

501 STANFORD, E. 6 *Charing cross, London, S.W.*—For excellent maps.

502 ZAEHNEDORF, J. 30 *Brydges st. Covent Garden, London, W.C.*—For the excellence in design and execution of his bookbinding.

504 JOHNSTON, W. & A.K. 4 *St Andrew sq. Edinburgh*.—For the excellence of their maps and illustrations of science.

505 WARD, M. & Co. 5 *Dawson st. Dublin*, and 13 *Donegall place, Belfast*.—For the beauty of their illuminated addresses, and general excellence in bookbinding and stationery.

509 ILLUSTRATED LONDON NEWS, 198 *Strand, London, W.C.*—For cheapness and excellence of their wood-engravings.

510 GRAY, J. 33 *Richmond-place, Edinburgh*.—For his map for the use of the blind.

519 THE QUEEN'S INSTITUTE FOR THE TRAINING AND EMPLOYMENT OF EDUCATED WOMEN, 25 *Molesworth st. Dublin*.—For the beauty of their illuminated addresses.

221J THE DEPARTMENT OF THE ORDNANCE SURVEY.—For novelty of style and delicacy of workmanship of trio-tinto engravings executed by James Duncan.

##### CANADA.

39 BROSSBAU, L. *Quebec*.—For excellent book-binding.

46 LOVELL, J. *Montreal*.—For the cheap and good educational works published by him.

##### AUSTRIA.

25 KNEPPER, W. & Co. 51 *Hauptstrasse, Wiedner, Vienna*.—For cigarette papers, and for an extensive collection of well-made fancy papers.

27 HARTINGER, A. & SON, 117 *Mariahilferstrasse, Vienna*.—For the excellence of their chromo-lithographs and oil-colour prints.

##### BELGIUM.

114 VAN DOOSSELAERE, J. S. *Ghent*.—For typography

110 CLAESSEN, CH. *Lidge*.—For illustrated works.

111 GABRIEL, C. *Braine l'Alleud*.—For pasteboard.

108 BREPOLS & DIEBCKX, SON, *Turnhout*.—For playing cards and fancy paper.

##### ITALY.

356 CAMBIAGI, FRANCESCO, *Director of the Royal Printing Office, Florence*.—For printing and bookbinding.

363 MAGLIA, PIGNA & Co. *Vaprio d'Alzano*.—For excellent and well-finished printing and writing papers.

365 PARAVIA, GIOVANNI BATTISTA, 23 *via Dora-grossa, Turin*.—For collection of educational works, globes and school apparatus, published by them.

366 RE, GIUSEPPE 4 *via Bourdin, Turin*.—Postage stamps.

368 RICCO, FELICE, *Modena*.—For nature printing.

371 MINISTRY OF PUBLIC INSTRUCTION, *Turin*.—For collection of objects for the instruction of the blind, deaf and dumb.

##### NETHERLANDS.

46B SITHOFF, A. W. *Leyden*.—For books in Chinese, Japanese, and other Eastern languages.

46D WOLTERS, J. B. *Gröningen*.—For illustrated books and engravings.

##### ROME.

32 OLIVIERI, L. —For excellence of ornamental binding in vellum.

##### SWEDEN.

12 KIERKEGAARD, *Gothenburg*.—For works on ship-building.

13 LJUNGBERG, G. *Stockholm*.—For economical and statistical maps of Sweden.

16 ROYAL RAILWAY OFFICE, *Stockholm*.—For map of Sweden.

17 SMITH, A. —For lithographic prints.

##### ZOLLVEREIN.

67 SCHWEITZER, SONS, *Odenkirchen*.—For pasteboard.

71 BAEDERER, T. *Essen, R. P.*—For lithographs of bird's eggs.

117 FABER, A. W. *Stein, near Nuremberg.*—For his excellent collection of artist's materials, and the superior quality of his slates and slate pencils.

118 PUSTET, F. *Regensburg.*—For albums, missals, and breviaries, bound in embossed leather.

## HONOURABLE MENTION.

## UNITED KINGDOM.

473 PERRY, J. & Co. 37 *Red Lion sq. and 3 Chrapside, London, E.C.*—For their collection of pens and pencil-cases, and India-rubber bands.

475 SMITH, J. & Co. 42 *Rathbone place, Oxford st. London, W.*—For tracing linen and general stationery.

476 TURNOR, M. & Co. *Icknield Port road, Birmingham.*—For good quality of pens, and improvement in mechanism of ever-pointed pencils.

483 WOGAN, C. H. 3 *Upper Sackville st. Dublin.*—For stationery and engraving.

485 ASHBY & Co. 79 *King William st. London, E.C.*—For superior specimens of bank-notes engraved by them.

491 GUY, BROTHERS, 26 and 27 *Academy st. Cork.*—For stationery and book-binding.

496 KNIPPE, J. A. *Moorrille, Carlisle.*—For a geological map of the British Islands.

497 LAYTON, C. & E. 150 *Fleet st. London, E.C.*—For superior engraving and stationery.

498 MARTIN, T. *Newton Abbot, Devon.*—For his machine engraved seals.

499 OLIVER & BOYD, *Edinburgh.*—For their collection of Educational works.

507 WORN, A. 4 *Molesworth st. Dublin.*—For engraving and illumination.

508 FORSTER & Co. 2 *Crow st. Dublin.*—For chromo-lithographs and show labels.

511 CALDWELL, M. 31 *South Frederick st. Dublin.*—For good specimens of book-binding.

514 HIBERNIAN BIBLE SOCIETY.—For their collection of Bibles in all languages.

## CANADA.

42 BROWN BROTHERS, *Toronto.*—For well made account books.

47 BUNTIN, A. *Montreal.*—For paper made in Canada.

49 DESBARATS, G. *Quebec.*—For good specimens of bookbinding.

## AUSTRIA.

28 LECHNER, R. *Grabengasse, Vienna.*—For educational works.

29 REIFFENSTEIN & ROESCH, 3 *Circusgasse, Vienna.*—For chromo-lithographs, and illustrated publications.

29A WINTERNITZ, C. 163 *Hauptstrasse, Vienna.*—For educational games.

## BELGIUM.

109 CALLEWAERT, BROS. *Brussels.*—For their atlases.

113 PLANCHE V. *Brussels.*—For ink.

## ITALY.

355 CORDOVA, NICOLÒ, *Palermo.*—For ornamental designs.

359 FAL DI BRUNO, Chev. FRANCESCO, 21 *Borgo S. Donato, Turin.*—For his writing apparatus for the blind.

361 FRANCO, SEBASTIANO & SONS, 27 *via Cavour, Turin.*—For the educational works published by them.

## NETHERLANDS.

46A BUFFA & ZONEN, F. *Amsterdam.*—For illustrated works on Netherlands and the Indies.

## SWEDEN AND NORWAY.

4 BONNIER, ALBERT, *Stockholm.*—For ethnographical work "Svenska Folket."

5 MANDELGBEN, N. M.—For work on Scandinavian monuments.

8 ERDURAU, PROF. AXEL.—For geological maps of Sweden.

9 ECONOMIC CHART WORKS, *Stockholm.*—For sea charts.

18 TOPOGRAPHIC CORPS.—For Ordnance maps.

## ZOLLVEREIN.

62 LAMBERTS, W. *Gladbach, R.P.*—For his account books.

63 LAMBERTS, J. H. *Gladbach, R.P.*—For his account books.

70 MATS & Co. *Berlin.*—For photographic albums.

119 ESCHERICH, TH. *Munich.*—For richly bound albums.

118 HOLTZMANN, G. *Carlsruhe.*—For tracing-paper.

120 LESER, S. *Frankfort-on the-Maine.*—For photographic albums.

## SECTION XVIII.—WOVEN, SPUN, FELTED, AND LAID FABRICS, WHEN SHOWN AS SPECIMENS OF PRINTING OR DYEING.

## South Gallery of Nave.

521 BATEMAN, L. J. & Co. 116 *Lower Gardiner st. Dublin.*—Silks, satins, velvets, laces, damasks, moreens, chintz, and feathers, dyed.

522 HANDS, SON, & Co. *Coventry.*—Skeins of dyed silks, the colours derived from aniline; spun silk, dyed, and the fibre removed by patent process.

LIST OF AWARDS.  
MEDAL.

## UNITED KINGDOM.

522 HANDS, SON, & Co. *Coventry.*—For a collection of different excellent colours in skein silk.

## BELGIUM.

117 IDIERS, E. *Auderyhem.*—For a variety of good colours in cotton yarn.

131 LIKVAIN, L. *Mechlin.*—For good dye of black silk and felt for hats.

## ITALY.

375 BRUNI, FRANCESCO & SON, *Milan.*—For excellent black dye on skein silk.

376 FOLETTI, WEISS & Co. *Milan.*—For cotton yarn dyed Turkey red.

## ZOLLVEREIN.

52 LAUREZARI, C. *Barmen, R.P.*—For a variety of good colours on cotton yarn.

74 BOCKHACKER, T. & SON, *Hueckeswagen, R.P.*—For dyed woollen yarns for cloth making.

## HONOURABLE MENTION.

## UNITED KINGDOM.

521 BATEMAN, L. J. & Co. 116 *Lower Gardiner st.* Dublin.—For garment dyeing.

## ITALY.

377 HUTH, PIETRO, *Como*.—For mineral black silk dy e.

## ZOLLVEREIN.

78 RITTERHAUS, J. P. *Bilk, near Düsseldorf, R.P.*—For Turkey red and cotton yarn.

## SECTION XIX. (A).—TAPESTRY AND CARPETS.

## East Corridor.

530 CORK CARPET CO. *Stratford, Essex*.—Cork carpets.—(*East Corridor, Ground Floor*.)

531 BRINTON & LEWIS, *Kidderminster*.—Velvet pile and Brussels power-loom carpeting.

532 DAGNELL & TILBURY, *Farm lane, Walham green, London, S.W.*—Coir and other fibres and matting; worsted mats; twines, patent lines, &c.—(*North Staircase*.)

533 TAYLER, HARRY, & Co. 42 *St. Paul's Churchyard, London, E.C.*—Kamptulicon floor cloth.—(*North Staircase*.)

534 TRELOAR, T. 10 *Ludgate hill, London*.—Cocoa nut mats, matting, and kamptulicon.—(*North Staircase*.)

535 WATSON, BONTOR, & Co. 35 & 36 *Old Bond st. London, W.*—Turkey, Indian, Persian, and velvet carpets. (See Illustration.)

536 WILSON H. & SON, *Grange st. Kilmarnock, N.B.*—Specimens of three-ply carpeting.

537 WAITE, B. 3 *Aire st. Leeds*.—Patent painted Mosaic carpeting on felt.—(*North Staircase*.)

538 TEMPLETON, J. & Co. *Glasgow and London*.—Patent Axminster carpets; hearth rugs; brocade curtains.

539 BARTON, J. E. *Kidderminster*.—Carpet.

540 FRANKLIN, J. D. 61 and 62 *St. Strand st. Dublin*.—Encaustic tile and other pattern oil-cloths.

541 HARE, J. & Co. *Bristol*.—Floor cloth.

542 LAPWORTH BROTHERS, 22 *Old Bond st. London*.—Axminster and Brussels carpets; Axminster hearth-rugs.

LIST OF AWARDS.  
MEDAL.

## UNITED KINGDOM.

530 CORK CARPET CO. *Stratford, Essex*.—Cork Carpeting; for novelty of manufacture.

531 BRINTON & LEWIS, *Kidderminster*.—For a large collection of carpets and rugs of good design, well coloured and of good manufacture.

532 DAGNELL & TILBURY, *Farm lane, Walham green, London, S.W.*—Coir and other fibres and matting, twines, and lines, for general merit.

533 TAYLER, HARRY, & Co. 42 *St. Paul's churchyard, London, E.C.*—Kamptulicon floor cloth; for excellence of design, colour, and manufacture.

534 TRELOAR, T. 10 *Ludgate hill, London, E.C.*—Cocoa-nut mats, matting; for great excellence of manufacture.

535 WATSON, BONTOR & Co. 35 & 36 *Old Bond st. London, W.*—Axminster carpet; for excellence of manufacture.

536 WILSON, H. & SON, *Grange st. Kilmarnock, N.B.*—Three-ply Kidderminster carpets; for excellence in design, colour, and quality.

537 WAITE, B. 3 *Aire st. Leeds*.—Painted Mosaic carpeting on felt; for novelty of manufacture.

538 TEMPLETON, J. & Co. *Glasgow and London*.—Axminster carpets and brocade curtains; for general excellence of design, colour and manufacture.

539 BARTON, J. E. *Kidderminster*.—Velvet pile carpet, with border; for good design, harmonious colouring, and very good quality.

541 HARE, J. & Co. *Bristol*.—Floor cloth without seam; for the reproduction of Roman Mosaic pavement.

542 LAPWORTH BROTHERS, 22 *Old Bond st. London*.—Axminster carpet; an imitation of Turkey, of excellent manufacture.

HENDERSON & Co. *Durham*.—For brocade velvet pile carpet, of floral design.

545 CORDNER & GRATTAN, 34 *Dame lane, Dublin*.—Fringes and gimps, carriage laces, &c.; for general merit.

## FRANCE.

63 IMPERIAL MANUFACTURES OF GOBELINS AND BEAUVAIS.—Gobelins tapestry; for great beauty and excellence in the reproduction of pictures, and for great beauty and excellence in tapestry for furniture.

63A BRAQUENIE BROTHERS, *Aubusson (Creuse)*.—Aubusson tapestry; for very fine tapestry panels.

74A FLIPO-FLIPO, J. F. *Tourcoing (Nord)*.—Reps for hangings, table cloths; for good designs and colours.

75 BOUCHARD FLOREN, C. E. A. *Tourcoing*.—Plain and figured reps; for novelties and general merit.

76 ARNAUD-GAIDAN, *Nismes*.—For general excellence of design, colour, and manufacture, showing great progress since last Exhibition.

81 MOURCHEAU, H. *Paris*.—For beauty of St. Maur tapestry, and general merit of the articles exhibited.

82 VAYSON, *Abbeville*.—For Aubusson carpet, and one velvet pile Persia design on crimson ground.

83 WALMEZ, DUBOIX, & DAGER, *Paris*.—For tapestry with rose-coloured ground, and for general excellence of exhibition.

## ROME.

13 FERRARI, Monsignor D. CIVIACO, *President of the Hospital of San Michele*.—Tapestry carpet—for excellence in the imitation of Mosaic.

## ZOLLVEREIN.

104 GEVERS & SCHMIDT, *Schmiedeberg, Silesia*.—For their imitation of Turkey and Persia carpets.

## HONOURABLE MENTION.

## UNITED KINGDOM.

540 FRANKLIN, J. D. 61 and 62 *Great Strand st. Dublin*.—For good quality of floor-cloth.

## ITALY.

87 LEVRA BROTHERS, *via Torino, Turin*.—For fringes for furniture.

## HOLLAND.

47 PRINS, WED. L. J. *Amsterdam, Arnhem, Deventer*.—For good quality and cheapness of woollen and cow-hair carpets.









## SECTION XIX. (B).—LACE AND EMBROIDERY.

## South Gallery of Nave.

**SEWED MUSLINS.**—A great source of employment for females has of late years sprung up in the North of Ireland, in the working of patterns on muslin with the needle. Belfast is the centre of this manufacture, which employs about 300,000 persons, chiefly females, scattered through all the counties of Ulster, and some localities of the other provinces. About forty firms are engaged in the trade, some being Irish houses and others agents for Scotch firms, and the gross value of the manufactured goods amounts to about £1,400,000.

**543 ALLEN, C.** 103 *Grafton st. Dublin.*—Manufacturing outfitter for ladies, infants, and children; lace manufacturers to Her Majesty, the Princess of Wales, &c. Irish point lace, guipure, and applique lace; Brussels point lace; Honiton lace; and Irish embroidery.—(Nare).

**544 COMMISSIONERS OF NATIONAL EDUCATION FOR IRELAND.**—Specimens of work by pupils of model schools.

**544A BEALE, Mrs.** Manager of the Reformatory School for Juvenile Offenders, established under the Act 21 and 22 Vic. ch. 103, at Spark's lane, Monaghan.—Specimens of work by the inmates.

**544B O'HAGAN, Mrs.** Manager of St. Clare's Industrial and National Convent School, Kenmare, co. Kerry.—Specimens of work by the pupils.

**544C ST. VINCENT'S FEMALE ORPHANAGE, North William st. Dublin.**—Specimens of work by the pupils.

**544D INDUSTRIAL AND NATIONAL CONVENT SCHOOL, Middleton, co. Cork.**—Specimens of work by the pupils.

**545 CORDNER & GRATTAN, 34 Dame lane, Dublin.**—Vallance drapery; fringes for drawing room curtains; curtain bands and tassels, gimps, &c.; carriage laces; silk and wool carriage linings.

**546 INDUSTRIAL DEPOSITORY, 76 Grafton st. Dublin.**—Irish point laces and pear tatting.

**547 ERNE, COUNTESS of, Crom Castle, Newtownbutler.**—Valenciennes lace, made at Lisnaska school, co. Fermanagh; cushion with lace and bobbins, showing the lace in process of being made.

Pillow lace making is at present carried on in many parts of Ireland, though not to any extent, because without the hearty support and co-operation of the merchants but a very small amount of good can be effected by nuns and other patronesses of schools.

About 100 years ago the manufacture of this beautiful fabric was introduced into Headford, a little town in the West of Ireland, by one of the ladies of the St. George family.

Mrs. St. George was not an imaginative woman; her ambition was to make her tenants industrious, to teach them to know and feel the profitableness of industry; being confident that, if this was once accomplished, comfort, and cleanliness, and thrift would follow. The result justified her wisdom. A marked epoch arrived in the annals of the hamlet, when Mrs. St. George established a school for the instruction of girls in pillow lace making; and this wise and noble act had the effect of so entirely changing the social condition of the inhabitants of Headford that in a few years they became as remarkable for their industry, forethought, and neatness, as they had before been for the opposite qualities.

As years went on, the prosperity of the place increased; merchants' travellers visited it to buy the lace, and leave extensive orders; huts gave place to comfortable cottages; and large well stored shops were opened to supply the increasing wants of the people. During the autumn of the year 1845 the writer passed through the little town. It was then like a hive of bees in summer, full of joy and activity, and the hum and noise of industry. At some of the cottage doors were groups of neatly-dressed young girls, seated on low

stools, their lace pillows on their laps; and while their fingers moved rapidly through the maze of bobbins, their voices filled the air, if not with melody, at least with heart music. Farther on might be seen a couple of elderly women, whose hands had not yet forgotten their cunning, working out intricate, if not very graceful patterns; or perhaps a young mother seated within the doorway, her foot gently moving a cradle, while her fingers plied their busy task. In about a year afterwards all this was changed. The young lace-makers fled away from the disease and destitution which followed on the failure of the potato crop in 1846, and sought in America and Australia (where wages were good) to better their condition. The travellers ceased to visit the place, and now it contains amongst its inhabitants but a few regular lace-makers, though a slight knowledge of the art is very generally known. Previous to the famine however, the lace manufacture at Headford was on the decline, and for this simple cause, that the patterns were becoming old fashioned, and no one was at the trouble of procuring new ones. The creative power of lace makers in general is very deficient. The manufacture is eminently imitative. The patterns are traced and pinholed on parchment, and no scope is allowed for the display of either taste or imagination; and thus the inventive faculties, being never called into exercise, become extinct.

Now, in France and Germany every one receives an art education. Men and women are taught to be designers, and to group and paint flowers. Mr. J. A. Hammersley, of Manchester (and he is no mean authority on such points), in a lecture on the "Influence of Art upon the community at large," delivered in London in 1850, said, "That, supposing the designer of every character were perfect, the best would be thrown away upon us with ill-educated workmen. If the design be not realized by the workman, it must lose all its vitality and beauty. In Lyons," he added, "I have seen men bring into their workshops quantities of flowers and draw them, merely for their beauty, not because they were obliged to do so. These are the men to make work beautiful, and to do justice to the designer."

Art education for the working classes is what we want in this country, and it is a want with which the legislature can directly grapple, as it needs only to provide for it in the schools maintained for the instruction of the children of the artisans and peasantry. Like Mr. Hammersley, I have "no belief in the statement that the people are not prepared for beautiful things in Art. That they want education in Art I readily admit; but that they have an instinctive love for it I fully believe."

The pillow lace trade might, I am confident, be once more established in Headford without difficulty. Every woman in it would willingly lend her aid, and there is a loud imperative call now that we should all unite and exert ourselves for the good of our fellow-countrymen and women.

At several other places in Ireland besides Headford pillow lace is manufactured. For instance, at Clarendonbridge, within six miles of the town of Galway, Valenciennes lace is made which could not be surpassed by the most skilled workers in France; it is the manufacture of the children of the nun's school. At Tallaght, in the County Waterford, lace is also made, particularly that known as Maltese, and which surpasses in beauty of design and finish any ever imported into this country from Malta; this is also executed by the children of a nunnery school. Now, nothing of this kind can ever, after all, be of any national value, though it may be a local benefit. Manufactures must be encouraged by merchants, and sold to them at prices which will enable them to take them into market. Ladies are

indispensable when the first attempt is being made to cultivate industrial resources in a village or district; but when the art or trade has once been fairly established, the aid of the merchants must be called in.

**548 FORREST, J. & SONS, 101 Grafton st. Dublin.**—A bridal suit of Irish point Brussels lace; Irish guipure, lacet, point, antique lace; Brussels lace.—(Nare.)

**549 GREEN, A. 136 Buchanan st. Glasgow.**—Embroidery upon velvet with fish scales; braiding upon merino; pin-cushion; tea infuser; smoking caps, &c.

**550 STANDING, J. & BROTHER, 18 Fountain st. and Liversy st. Mill, Manchester.**—Braids and braided cords; boot and corset laces, lines, crinoline steel, fringes, tubular braids, &c.

**551 COCHRANE, JOHN & SONS, 21 D'Olier st. Dublin,** sewed muslin manufacturers, and pattern designers for all kinds of embroidery.—Embroidered muslin cloaks, shawls, lawn handkerchiefs, lace, &c.

Embroidery on muslin, and manufacturing of sewed muslins, were introduced into Ireland, at Donaghadee, County Down, by John Cochrane, at the beginning of the present century, and spread through all parts of the country, giving most beneficial employment to the daughters of the peasantry at their own homes. Ten years ago it was calculated that 200,000 females were employed in its production, and the sum paid for sewing estimated at not less than £500,000.

**552 DUNNICLIFF & SMITH, Stoney st. Nottingham.**—Patent imitation Valenciennes and other laces; fancy nets and laces, &c.—(Nare.)

**554 JACOBY & Co. Stoney st. and Broadway, Nottingham.**—Cotton laces; patent Valenciennes laces; patent black silk Maltese laces, &c.

**555 HARDY, J. & Co. Stoney st. Nottingham.**—Lace trimmings; imitation blonde laces; silk, fancy, and patent nets; quillings, laces, edgings, shawls, &c.

**556 DUNRAVEN, COUNTESS OF, Adare, co. Limerick.**—Lace; embroidery; hosiery; by pupils of Industrial School.

**558 BOOTH & FOX, Cork, and 80 Hatton garden, London, E.C.**—Eider and Arctic goose down quilts and skirts; down vests, goose down dressing gowns; opera cloaks.

**559 FRY, W. & Co., Kevin st. Dublin.**—Carriage laces and linings.

The Messrs. Fry are, so far as we know, the only manufacturers in Ireland of pure silk. The material which they produce is intended for carriage blinds, and is purchased by many of the principal railways in England. But there is scarcely one railway company in the United Kingdom which does not procure its carriage laces from the Kevin street factory. The monogram of the company is in most cases woven into the lace. All the leading coachmakers are supplied, and the process of manufacture is very peculiar. Each loom produces from ten to sixteen laces of different patterns. Cotton, worsted, linen, and silk are employed, the linen and cotton threads forming the body, the worsted making the raised pattern, and the silk constituting the face of the fabric.

## LIST OF JURY AWARDS.

### MEDAL.

#### UNITED KINGDOM.

**543 ALLEN, C. 108 Grafton st. Dublin.**—For excellence of workmanship and design in Irish lace and embroidery.

**546 INDUSTRIAL DEPOSITORY, 76 Grafton st. Dublin.**—For superior workmanship in Irish point lace, crochet, and pearl tatting lace goods.

**547 ERNE, COUNTESS OF, Crom Castle, Newtownbutler,**—For Irish made Valenciennes lace.

**548 FORREST, J. & SONS, 101 Grafton st. Dublin.**—For excellence of design, work, and finish of Irish

point, Brussels, guipure, lacet and antique lace goods; a great improvement on any goods exhibited at any previous Exhibition.

**551 COCHRANE, J. & SONS, 21 D'Olier st. Dublin.**—For excellence of Irish work in embroidered muslin cloaks.\*

**552 DUNNICLIFF & SMITH, Stoney st. Nottingham.**—For excellence of manufacture in patent machine made Valenciennes lace, (which, except by experts, are difficult to be distinguished from real) and for imitation black and white Maltese laces.

**554 JACOBY & Co. Stoney st. and Broadway, Nottingham.**—For excellence of manufacture in patent Valenciennes laces, black Maltese laces (which are a triumph in machine made goods), and other imitation laces.

**555 HARDY, J. & Co. Stoney st. Nottingham.**—For superior manufacture of machine-made blonde laces, black garland laces, and fancy silk nets.

**558 BOOTH & FOX, Cork, and 80 Hatton garden, London, E.C.**—For Eider and Arctic goose down quilts, skirts, &c.

#### MALTA.

**2 MICALLEF, SALVATORE, 82 Strada Piatro.**—For a black Maltese shawl and parasol cover.†

**3 MUNERO, V.**—For a white Maltese rotunde mantle.

#### BELGIUM.

**118 BEELS, D. & SISTER, Ghent.**—For duchess lace; original invention and excellence of work.

**119 DENIS, J. Brussels.**—For excellence of work in gold embroidery.

**120 GHYS-BRUYNEEL, P. F. Grammont.**—For excellence in make of real black talma, &c.

**121 GHYSELS & Co. Brussels.**—For Brussels lace.

**122 HOORICKX & Co. Brussels.**—For superior manufacture of Brussels lace, especially à barbe, en point gaze, en relief.

**123 HOUTMANS, A. J. Brussels.**—For good designs for lace.

**124 HOUTMANS, C. C. Brussels.**—For good designs for lace.

**126 STOCQUART, BROS. Grammont.**—For excellence of make of real black lace point.‡

**127 VAN DER DUSSEN D'HABBEKE, Brussels.**—For superior designs for lace.

**128 VAN ROSSUM, J. B. Hal.**—For excellence in Brussels point gaze lace and handkerchief.

#### FRANCE.

**80 LEFEBURE & SON, Paris.**—For superior excellence, and fineness of manufacture, and elegance of design. This is the best and most beautiful collection of real lace goods in the Exhibition.

**82 DOGNIN & Co. Paris.**—For fineness and excellence of manufacture in black and white lama lace goods.

#### ITALY.

**388 MARTINI, LUIGI, Milan.**—For gold and silver brocade and embroidery.

**383 BIELLA, ANTONIO, 1 via dei Rastrelli, Milan.**—For alto-relievo embroidery on gold and silk ground.

**385 FRATTI, ROSINA, Reggio, Emilia.**—For an embroidered portfolio.

\* The Jury regret to find a total absence of all competition in this class of industry.

† The prices quoted for these goods are far above their commercial value.

‡ The design of the shawl appears to be too elaborate and crowded.

## HONOURABLE MENTION.

## UNITED KINGDOM.

549 GREEN, A. 136 *Buchanan st. Glasgow*.—For embroidery with fish scales.

## BELGIUM.

125 RAY, Mrs. S. *Brussels*.—For a Brussels lace parasol cover.

## FRANCE.

75A FERGUSON, SON, 40 *Rue des Jeuneurs, Paris*.—For black and white lama laces.

## SECTION XX.—ARTICLES OF CLOTHING.

## South Gallery of Nave.

THE jurors of Class XX. awarded no less than three medals for Balbriggan hosiery, thus showing the importance they attach to this branch of Irish manufacture, the production of which is rapidly increasing. We attribute its rapid growth to the introduction of improved machinery by one of the successful exhibitors, Messrs. Smyth and Co., who by this means have been enabled successfully to compete with the manufacturers of an article which, although extensively sold as "Balbriggan hosiery," is merely an imitation of the genuine article. The introduction of the new machinery far from proving a substitute for manual labour, has only proved a valuable auxiliary, as Messrs. Smyth and Co. are now enabled to employ five times the number of hands they had some years since. Messrs. T. and W. Pike, and Mr. H. Appleyard, of Balbriggan, are the other successful competitors.

581 BURY & Co. 42 *Queen st. Dublin*.—Kid and goat skins in the hair, in white leather, and variously dyed; kid and goat gloves.

582 CATTAMACH, W. *Bankfoot, Perthshire*.—Sporrans for gentlemen and Highland volunteers.

583 CROTTY, T. 57 *William st. Dublin*.—Ladies' crinoline, skirts, and stays.

584 ELLWOOD, J. & SONS, 24 *Great Charlotte st. (S.) and 40 Cheapside (E.C.) London*.—Patent air chamber hats, helmets, &c., for tropical climates.

585 FIRMIN & SONS, 2 *Dawson st. Dublin*, and 153 *Strand, London*.—Military, naval, hunt, and club buttons; military and naval ornaments; swords, &c.

586 FOLEY & CROKER, 24 *College green, Dublin*.—Army, navy, livery, hunt, club, and fancy gilt buttons.

587 HUNTER, BARR, & Co. 49, *Jamaica st. Glasgow*.—Satin hats, felt hats, Tweed hats, cloth caps, Scotch bonnets.

588 JENNETT, J. 23 *Essex quay, Dublin*.—Portable boot trees and stretchers; buskin trees; improved boot cleaners; glove trees and stretchers; anatomical lasts.

589 PIKE, T. & W. *Balbriggan, co. Dublin*.—Ladies' open-work and embossed stockings; side and front lace stockings; gentlemen's socks, drawers, and under-waistcoats.

590 SCOTT, J. W. *Sidbury Works, Worcester*.—Patent solid leather buttons, gun wads, &c.

591 SWITZER, FERGUSON & Co. *Commercial Hall, Grafton st. Dublin*.—Embroideries on Lyons' velvet, Gros glacé silk, scarlet cloth, black velvet, and Cashmere; velvets; satins; silks.

592 WRIGHT & STANLEY, 11 *Lower Ormond Quay, Dublin*.—French silk, and felt hats; hats in various stages of manufacture.

593 ALLEN, R. 28, *Lower Sackville st. Dublin*, and 69, *Patrick st. Cork*.—Irish court dress; state liveries.

594 HEATH, AUSTIN, & MYCOCK, *Browning st. Stafford*.—Ladies' boots and shoes.

595 LEMAN, L. 38 *Grafton st. Dublin*.—Embroidered church vestments and ornaments.

596 MERRY, J. 6 *Chestnut place, Lower Clanbrassil st. Dublin*.—Silk and other cockades.

577 SMYTH & Co. 36 and 37 *Lower Abbey st. Dublin and Balbriggan*.—Balbriggan hosiery.

578 TAIT, P. & Co. *Limerick*.—Army clothing.

579 WRIGHT, J. 33 *Westmoreland st. Dublin*.—Silk and felt hats; velvet and fancy caps, &c.

580 BULLOCK T. & SONS, *Birmingham*.—Buttons.

581 BUSSET, G. G. & Co. 482 *New Oxford st. London, W.*—Patent buttons.

582 CARLETON, R. *Westmoreland st. Dublin*.—Ladies' and gentlemen's boots.

583 APLEYARD, H. 36 *Lower Sackville st. Dublin*.—Balbriggan hosiery.

584 CLOWES & WOODWARD, 27 *Dame st. Dublin*.—Naval and military full and undress head-dresses; cavalry helmets; staff officer's cocked hats; infantry shakos; swords, sabres, laces, belt-plates, &c.

585 LYNCH, T. 27 *Westmoreland st. Dublin*.—Silk, woollen, and cotton hosiery.—(*Agricultural Hall, Kildare st.*)

LIST OF JURY AWARDS.  
MEDAL.

## UNITED KINGDOM.

581 BURY & Co. 42 *Queen st. Dublin*.—For well prepared kid and goat skins.

583 CROTTY, T. 57 *William st. Dublin*.—For well-made crinoline, stays, and ladies' skirts.

584 ELLWOOD, J. & SONS, 24 *Great Charlotte st. S. and 40 Cheapside, E.C. London*.—For excellent ventilating hats.

585 FIRMIN & SONS, 2 *Dawson st. Dublin*, and 153 *Strand, London*.—For fine display of buttons and military ornaments.

587 HUNTER, BARR, & Co. 49 *Jamaica st. Glasgow*.—For well-made hats and caps of all kinds.

589 PIKE, T. & W. *Balbriggan, co. Dublin*.—For excellent ladies' and gentlemen's stockings, &c.

590 SCOTT, J. W. *Sidbury Works, Worcester*.—For solid leather buttons of good quality.

592 WRIGHT & STANLEY, 11 *Lower Ormond quay, Dublin*.—For good silk and felt hats.

593 ALLEN, R. 28, *Lower Sackville st. Dublin*, and 69, *Patrick st. Cork*.—For Irish court dress and state liveries.

594 HEATH, AUSTIN, & MYCOCK, *Browning st. Stafford*.—For well made ladies' boots and shoes; wholesale trade.

597 SMYTH & Co. 36 and 37 *Lower Abbey st. Dublin*.—For Balbriggan hosiery.

598 TAIT, P. & Co. *Limerick*.—For army clothing of good quality.

580 BULLOCK, T. & SONS, *Birmingham*.—For excellent buttons.

582 CARLETON, R. *Westmoreland st. Dublin*.—For good display of ladies' and gentlemen's boots.

583 APLEYARD, H. 36 *Lower Sackville st. Dublin*.—For Balbriggan hosiery.

- 815 FEMALE BLIND SCHOOL, *St. Mary's, Portobello.\**  
 544B CONVENT NATIONAL SCHOOL, *Middleton.\**  
 544C ST. VINCENT'S ORPHANAGE, *South William st. Dublin.\**  
 816 NATIONAL INSTITUTION AND MOLYNEUX ASYLUM, *Leeson park. Dublin.\**

## CANADA.

- 50 DE WITT, J. *Montreal.*—For good buckskin mits and gloves.

## AUSTRIA.

- 30 JAQUEMAR, G. *Herrengasse Vienna.*—For leather gloves of good quality.

## BELGIUM.

- 105 VANDEN BOS-POELMAN, *Ghent.*—For good seamless long boots, and for good make.  
 106 WATERGANT, A. *Brussels.*—For boots and shoes.  
 129 FRENAY, BROS. *Roclenge, Prov. of Limburg.*—For straw plaits, bonnets, and hats.  
 130 LAINGLET, J. *Brussels.*—For silk corsets, &c.

## FRANCE.

- 73 POIBOTTE, F. *Paris.*—For boots and shoes.  
 74 TREFOURSE & Co. *Chaumont.*—For gloves.  
 85 POIBOTTE, M<sup>me</sup>. *Paris.*—For corsets.  
 86 BAGRIOT, F. A. *Paris.*—For very fine series of buttons of superior quality and great taste.

## ITALY.

- 396 BOSSI, EDOARDO, 179 *strada Toledo, Naples.*—For gloves and kid skins.  
 397 CONTI, CESARE, S. *Jacopino, Florence.*—For excellent straw plait hats, &c.

\* These medals are awarded for the ingenuity and skill displayed by the children and blind persons, and as an encouragement to similar institutions.

## HONOURABLE MENTION.

## UNITED KINGDOM.

- 566 FOLEY & CROKER, 24 *College green, Dublin.*—For buttons.  
 568 JENNETT, J. 23 *Essex quay, Dublin.*—For trees and stretchers for boots.  
 571 SWITZER, FERGUSON, & Co. *Commercial Hall, Grafton st. Dublin.*—For embroideries on silk, velvet, &c.  
 579 WRIGHT, J. 33 *Westmoreland st. Dublin.*—For silk and felt hats and velvet caps.  
 581 BUSSEY, G. G. & Co. 482 *New Oxford st. London, W.*—For patent buttons.  
 585 LYNCH, T. 27 *Westmoreland st. Dublin.*—For silk, woollen, and cotton hosiery.

## AUSTRIA.

- 32 HAHN, L. *Köllnerhofgasse, Vienna.*—For fancy ladies' shoes.  
 33 KUMPF, PIUS, *Schluckenau, Bohemia.*—For straw plaits.  
 33A BRAND & Co. *Vienna.*—For buttons of all kinds.

## BELGIUM.

- 131 LIÉVAIN, L. *Mecklin.*—For silk and felt hats.  
 132 VAN NIEUWENDERG, BROS. *Lokeren.*—For silk and felt hats.

## ITALY.

- 399 PONZONE, ANTONIO, *via Santa Margherita, Milan.*—For hats.

[NOTE.—It is to be regretted that some of the Sections in this Class were not better represented, especially that of Textile Fabrics; this may be partly accounted for by the fact, that many of the leading manufacturers, when canvassed, assigned as their reason for refusing to exhibit, the pecuniary loss they had experienced, at the London Exhibition of 1862, in the injury their goods had sustained from exposure to light and dust; also to the great depression that prevailed at the time in some of the branches of this industry. For example, the lace manufacturers of Nottingham, had to be provided with glass-case accommodation before they could be induced to exhibit. A similar offer was made to the ribbon manufacturers of Coventry but without success.]

## SECTION XXI.—CUTLERY AND EDGE TOOLS.

## North Transept.

- 591 GREENSLADE, E. A. & W. *Thomas st. Bristol.*—Planes.  
 592 LEGGIE, W. *Premier Works, Sheffield.*—Light tools; heavy edge tools of various kinds; elastic hay and manure forks; augers; shears; hoes and garden tools.  
 593 MARSHALL, S. *Globe Works, Sheffield.*—Patent scythes, and scythe blades; patent hay knives; garden hoes; ship scraper; cheese, saddlers, straw, turnip, and other knives, &c., &c.  
 594 MOGG, J. & Co. *Adelaide Works, Redditch, Worcestershire.*—Needles; fish hooks; and fishing tackle.  
 595 RODGERS, J. & SONS, *Sheffield.*—Cutlery.  
 596 SUTTON, W. & SONS, 44 *Newtown row, Birming-*

*ham.*—Shoemakers, carpenters, and saddlers' awl blades packing needles, &c., &c.

- 597 THOMPSON, J. 9 *Nassau st. Dublin.*—Cut steel goods, &c., &c.; sporting and hunting knives, daggers; table cutlery, &c.  
 598 KIRBY, BEARD, & Co. 62 *Cannon st. West, London.*—Pins, needles, and fish hooks.  
 600 BOULTON, W. & SONS, *Redditch.*—Needles and fish hooks.  
 601 EADON, M. & SONS, *Sheffield.*—Edge tools.  
 603 THOMPSON & O'NEILL, 7 *Henry st. Dublin.*—Table knives; carvers; pocket knives; razors; court-dress swords and buckles.  
 604 KING & PEACH, *Hull.*—Edge tools.

## SECTION XXII.—IRON AND GENERAL HARDWARE.

## South Side of Nave.

THERE was scarcely a department of the Exhibition more interesting than the Hardware Court, and certainly there was none so characteristically British. The Frenchman surpasses us in silks and tapestries, the Belgian and the Austrian are our competitors in lace, and glass, and leather work; but, though French bronzes are graceful, and Belgian iron work is strong and durable, the pre-eminence in the various applications of the most useful of the metals to the many purposes of industry and the arts, still belongs to the United Kingdom; and as long as the furnaces of Staffordshire and the foundries of our great manufacturing towns continue to work, is likely to remain here. This department of labour was not, of course, so largely represented in the Dublin Exhibition as in the London of 1862, still there were some very important and carefully furnished stands. Let us begin by referring to the Irish Exhibitors, who, even amidst such competition, acquitted themselves in a manner creditable to native energy and skill. Messrs. Hodges and Sons, of Westmoreland-street, had a very large and splendid collection, amongst which must be noticed chiefly several beautiful chimney pieces of statuary marble, elaborately carved, and fitted with suitable grates of excellent workmanship and handsome design. Other chimney pieces are carved in oak. Two or three very neat and useful stoves occupy prominent places. These are designed to save fuel and to secure a perfect radiation of heat. One small object in the collection was exceedingly worthy of notice. It was a very perfect piece of forged wrought iron work, a sample of an office desk rail, executed for the Standard Life Assurance Company. No more creditable specimen of native manufacture in the metals was to be found in the Exhibition. Of a similar character was a wrought iron altar rail in the Gothic style. The bronze statuettes, shown by the Messrs. Hodges were very attractive and elegant. The attention of the visitor was at once arrested by the really magnificent display of lamps, chandeliers, and lustres of all sizes and patterns, which formed the most prominent objects in the stand of Messrs. Edmundson, of Capel-street. Some of these were bronzed, others were brass; there was excellent mediæval work, and the designs are remarkable for merit. Decorative work of this class fairly comes under the head of art. There were some fine bronze statuettes, which occupy places upon the chimney pieces of statuary marble that form so prominent features in the stand. These were furnished with very suitable grates, which rested upon tiled floors of handsome designs. There was a very pretty model of the Leamington kitchen range, and a very ingenious spring mattress, patented by Smee, which seems to possess several peculiar advantages. On the whole the Messrs. Edmundson may be congratulated upon the excellence of the objects which they exhibited, and upon the good taste with which they were arranged. The coal vases which they showed were beautifully japanned, and as ornamental as useful. Mr. Maguire, of Dawson-street, exhibited some very good specimens of fancy japanned work, and ornamental vases of graceful design. The bronzes were admirable in design and workmanship. Mr. Fletcher, of Baggot-street, was a prominent exhibitor in the same class of goods. Mr. Sloane, of Stephen's-green, sent in various examples of altar and pulpit rails, mediæval church lights, and coronas and Gothic doors. Mr. Sheridan, of Dublin, had a portion of a circular iron staircase; and Mr. Murphy, of the Eagle Iron Works, in Church-street, a wrought iron safe, very strong, appropriate to its purpose, and constructed so as to be fire-proof. Mr. Gatchell, of Dawson-street, had a variety of scales and weights suited for the nicest operations of chemistry, adjusted with singular exactness, and constructed upon the most approved principles. These were used in the Exhibition by the agents of the Union Bank of Australia, and the Bank of Australasia for weighing the gold dust sent from Melbourne, and shown in the Victoria Court.

Amongst the English exhibitors in this section the most eminent was Mr. Henry Crichley, of Sheffield-place, Birmingham, who has gained a great reputation as a manufacturer of stoves and grates of the most ingenious designs and useful application. Of this may be cited one remarkable illustration. Taking grates as at present constructed, what housekeeper has not had reason to complain that the grate which is suited to Winter use is not suited to Spring or Summer? The consumption of fuel must be varied with the season, and hitherto the only means of contracting a grate has been to insert two or three ugly bricks at one end of the fire. Every one knows how unsightly this mode becomes when applied to a drawing-room or a parlour. To meet this inconvenience Mr. Crichley has devised a very simple and ingenious expedient. A handle or nob stands on the lower bar of his grates. By pulling this, two steel plates, which are worked by a novel use of the eccentric, advance from the sides, and a grate originally more than two feet in front can be reduced to twelve inches. No more useful or available plan could have been adopted, and it is no wonder that Mr. Crichley's grates have gained so wide and so well deserved a celebrity.

Then there is the old nuisance of smoky chimneys. To meet this Mr. Crichley has constructed a valve at the back of the grate which can be opened at pleasure, and doubles or trebles the draught. Or again, it is desired to light a fire quietly. For this purpose he has constructed flanges, which, when not in use, are concealed behind the sides of the grate, but, when necessary, advance above the bars and create an immediate draught. Nor is the workmanship of those excellent specimens of iron work inferior to their design. They manifest artistic taste and extraordinary care in the construction. The steel employed is of the very best description and is susceptible of the highest polish. The drawing room grates show the very prettiest combination of colouring and material. The fine work in brass and bronze, and the beautiful tiling which forms the hearth, cannot fail to attract attention. The brass and bronze fenders which surround it are of the neatest and most suitable designs. And the cheapness of these really splendid articles is quite as remarkable as their beauty. A grate of the highest workmanship may be had for comparatively a few pounds. Mr. Crichley has gained considerable credit by sending over so many serviceable and attractive specimens of his craft. It is due to him to mention that he was the first to introduce into Birmingham this department of labour, of which, until recently, Sheffield was the principal seat. Mr. Crichley has a speciality for the manufacture of hall stands, which he renders not only useful, but most elegant articles of furniture. Several specimens of these were in the first class refreshment rooms, and attracted considerable notice. They were constructed of cast iron, and bronzed so beautifully that the most skilful eye could not detect the material employed. The castings are perfect in respect of sharpness of outline, and the diaper ormolu bars are first-rate specimens of the work which can be done by the use of a die. The bronze is accomplished by the aid of electricity, and cannot wear out. The centre piece of each stand consists of Minton's tiles in suitable colours. In cheapness of price these articles match the grates of the same manufacturer.

Opposite to his stand was that of Messrs. Edwards and Son, of London, who exhibited the finest and most expensive descriptions of drawing-room and library grates, in which is used not only very elegant tiling, but a description of polished steel which is quite as lustrous as plate glass. The tiles used in the upper part of the grates are painted with great taste. A very conspicuous feature of this section was the patent safety revolving shutter by D. Clarke and Co., of Birmingham, which is made of corrugated iron, is easily worked, and becomes a most efficient protector of shop windows. Messrs. G. Salter and Co., of West Bromwich, exhibited a large assortment of patent dynamometers, steam pressure gauges, and spring balances, which were carefully adjusted and neatly finished. The safes of Mr. Chatwood seem to be admirably fitted to protect money and books against the twofold danger of fire and burglary. Mr. G. Kent, of London, had a number of his patent machines for cleaning knives, which are so well known and generally approved of. He also showed a very ingenious churn, which will make butter in less than three minutes, an apparatus which is intended specially for the preparation of soups, and a brushing machine which removes all the dust from carpets and floors, and collects it in a box, not unlike that which is ordinarily affixed to lawn-mowers.

**606 HODGES & SONS, 16 Westmoreland st.**—Kitchen apparatus.—(*Agricultural Hall, Kildare st.*)

**607 BROWN & GREEN, Georges st. Luton, Bedfordshire.**—Patent and close fire self-acting kitchen ranges; improved cottage range.—(*Agricultural Hall, Kildare st.*)



Prize Medal awarded.

The cut on p. 279 represents one of the new patent kitchen ranges exhibited by Messrs. Brown and Green; its special advantage is that of a close range with an open chimney, thus avoiding all close heat or smell in the kitchen; it has two roasters or ovens, and a wrought iron boiler at the back; it is also made with an oven on one side, and a boiler on the other. The steam kettles are not necessary appendages, except where much cooking is required, and they may be placed in any other part of the kitchen instead of on the hot plate. The ovens are heated by the flues passing over to the chimney, and by a cast iron plate, which, receiving heat

from the fire, conducts it direct to the bottom of the oven; all descending flues are thus avoided, consequently the chimneys may be left open. The large and handsome range exhibited by the firm which attracted so much attention, is a fine specimen of workmanship; it is similar in principle to the one for which a medal was awarded to them at the London International Exhibition, 1862. It contained two large roasters, three spacious ovens, a grilling stone, two large wrought iron boilers, an extensive hot plate, two plate racks, &c, and when fitted with steaming apparatus, is capable of cooking for about 2,000 persons. It has an excellent arrangement for roasting in front of the fire, and is fitted with conical pipes for ventilating the kitchen; it is made of all sizes from three feet upwards; the ovens are heated in the usual way by flues passing round them. Both of the above ranges are certain preventives for smoky chimneys. These ranges are sold in Dublin by J. Edmundson and Co., Capel-street.

**608 M'SHERRY, M. 10 Bank place, Limerick.**—A newly invented kitchen range.—(*Agricultural Hall, Kildare st.*)

**609 KIDGELL, F. 103 St. Hampton st. Birmingham.**—Founders' models, brass and metal letters, fancy letters, stencil plates, pattern name plates.—(*Agricultural Hall.*)

**610 SMITH & WELLSTOOD, 7 Capel st. and 74 Great Strand st.**—Portable kitchen ranges; cooking and heating stoves; portable farm, laundry and kitchen









**633 CURTIS, W. & SONS, Chancery lane, and 99 Middle Abbey st. Dublin.**—Water cocks; gas fittings; and railway carriage furniture.

**634 FLETCHER, A. 10 Lower Baggot st. Dublin.**—Shower and other baths; japanned toilet sets; fancy wire work.

**635 KENT, G. 190 High Holborn, London, W.C.**—Patent knife-cleaning machine; carpet sweeper; churns, strainers, and other patent utensils.

**636 BOURNE, S. Healdstone Drive, Harrow, N.W.**—Casks and other vessels fitted with the "Patent Flexible Diaphragm;" valves for escape of gas from liquids.

**637 BRABY, F. & Co. Fitzroy Works, Euston road, London.**—Patent galvanized iron and zinc chimney flues; zinc sash bars, gutters, ridging, &c., &c.; galvanized wrought-iron cistern.

**638 CLARK & Co. Rathbone place, Oxford st. London.**—Model of bay window, closed with patent self-coiling shutter.

**639 JAMES, SONS, & AVERY, King's Norton, and Bradford st. Birmingham.**—Patent self-boring wood screws in brass and iron.

**640 MURPHY, L. Eagle Iron Works, 153 Church st. Dublin.**—Wrought iron safe, fire-proof and thief-proof.

**641 MOREWOOD & Co. Birmingham.**—Corrugated iron.—(*Agricultural Hall.*)

**642 HINKS, J. & SON, Birmingham.**—Patent fumivore lamps.

**643 HODGES & SONS, 16 Westmoreland st. Dublin.**—Chimney pieces; stoves; grates; fenders; balconies; hand rails.

**644 RIDDELL & Co. Belfast.**—Medieval brass and iron work; gas pendants; chandeliers; brackets; marble chimney pieces.

**645 LUCAS, G. 44 Kennedy st. Manchester.**—Sign plates.

**646 PATENT ENAMEL CO. 288 Bradford st. Birmingham.**—Enamelled iron labels.

**647 SHERIDAN, J. 163 Church st. Dublin.**—Bell, 30 cwt. (*West Verandah*); Gothic entrance gates and piers (*Garden*); geometrical staircase; safe.

**648 MURPHY, J. 14 Thomas st. Dublin.**—A peal of eight joy bells, in key of D natural, weight five tons; the tenor bell twenty-six hundred.—(*In Garden.*)

**649 PHILLIP, C. J. 20 Caroline st. and 29 Mary st. Birmingham.**—Gas lamps.

**650 MEARS & Co. 267 Whitechapel road, London.**—Hemispherical bells; hour and four quarter bells; peal of ten.—(*Benson's Clock.*)

**650A WINSTANLEY & JEPSON, 36 Corn market, Dublin, and Salt market, Glasgow.**—Clogs; clay irons, &c.—(*Agricultural Hall, Kildare st.*)

**650B FARRELL, J. J. Dublin.**—Horse shoes.

### SECTION XXIII.—WORKING IN PRECIOUS METALS AND THEIR IMITATIONS, JEWELLERY, AND ARTICLES OF VERTU AND LUXURY, NOT INCLUDED IN OTHER CLASSES.

#### North End of Transept.

**651 BARKENTIN, J. & SLATER, 291 Regent st. London, W.**—Vases in oxydized silver, decorated with groups of figures, in repoussé work—The Alexandra Vase; exhibited by permission of Her Royal Highness the Princess of Wales.

**652 RYAN, J. R. & Co. 13 College green, Dublin.**—Jewellery and watches.

**653 SCHRIEBER, J. & SONS, 23 Westmoreland st. Dublin.**—Plate and jewellery, chronometers and watches.—(*Nave.*)

**654 TOPHAM & WHITE, 33 Grafton st. Dublin, WHITE, E. 20 Cockspur st. London.**—Jewellery and enamels.

**655 BELL BROTHERS, 15 Grey st. Newcastle-on-Tyne.**—Works of art in aluminum.

**656 PRIME, T. & SON, Birmingham and Dublin.**—Services in silver and electro-plate; ornamental plate, &c.

**657 FLAVELLE, H. E. 43 Grafton st. Dublin.**—Model of the Ark of the Covenant, one-third of the original size; plateau and epergne; figures, centre-pieces, marine figures, flower vases.—(*South side of Nave.*)

**658 BRUNKER, T. 111 Grafton st. Dublin.**—Watches; plate; jewellery, &c.—(*Nave.*)

**659 WATERHOUSE & Co. 25 Dame st. Dublin.**—Jewellery; table ornaments; electro-plate, &c.

The brooches exhibited by Messrs. Waterhouse were highly interesting, both as regards workmanship and association, especially the largest, the Royal Tara Brooch,



The Royal Tara Brooch (front view.)



character of most of the ornaments found upon it—though examples of a few of them may be found of an earlier antiquity—that its age should be assigned to that period when such arts were carried to the greatest artistic perfection, namely, the eleventh, or perhaps, the early part of the twelfth century. And further—should it be an object of inquiry what the probable rank of the owner of such a costly ornament had been, I would, with as little hesitation express my opinion that the rank must have been a princely one, as we have the authority of a tract of our most ancient Brehon laws, that the size and value of the Aicde Argiot, or silver brooch should be in proportion to the rank of the wearer."

It is only in the most remote and obscure pages of the history of Ireland that we meet with any mention of the more useful class of ornaments, worn by its inhabitants; and, had it not been for the specimens found in comparatively recent times, and their preservation in the Museum of the Royal Irish Academy, their existence might have been altogether doubted.

The first successful attempt at redemption, that we know of, was made by Messrs. Waterhouse and Company, in the year 1842, by converting copies of antique Irish fibulæ (with the addition of a pin) into brooches. In their original form, these curious gold ornaments were apparently useless, and totally inapplicable to modern purposes. For a considerable time, this was the only ornament essentially Irish, to be found amongst the jewellers of Dublin, and might have remained so but for the free access granted to the public by the Royal Irish Academy to their collection of antiquities. In 1849, attention was drawn to a report read by the Rev. Charles Graves, F.T.C.D. (now Bishop of Limerick), on an ancient Irish brooch, bearing an inscription in the Ogham character, which led to an examination of similar ornaments, deposited in the Museum; though generally on a colossal scale, their former utility was obvious, and, if reduced to a moderate size, their applicability to modern use equally apparent. The facilities afforded by the Academy enabled Messrs. Waterhouse and Company to take correct drawings and models of the best patterns, which eventually led to an extensive manufacture of them; and, from that period, a steady and increasing demand has arisen, to which their admitted superiority, in security and effect, has mainly contributed. Ireland can now boast of the continued use of peculiarly national ornaments worn by her princes and nobles in ages long since passed.

In the copies of these brooches, in silver, and also in silver gilt, and oxidized, and in gold, the distinctive characters of the original are strictly preserved, while the articles are adapted to modern use and ornament, for which their delicate interlacing and piercing peculiarly recommend them, and as evidences of the highest cultivated skill. Amongst our illustrations will be found the celebrated Royal Tara Brooch; the exquisite perfection of its workmanship and variety of design, made

it an attractive object to visitors at the Great Exhibition of 1851, and all subsequent exhibitions, including the interesting display of last Summer. This brooch was first brought before the scientific public by the author of the celebrated work on the Round Towers of Ireland, George Petrie, Esq., LL.D., M.R.I.A., whose interesting account was read before the Royal Irish Academy, on the 8th of December, 1850. The purchase of this beautiful relic was rather singular. On the 24th of August, 1850, a poor woman, who stated that her children had picked it up on the sea shore, offered it for sale to the proprietor of an old iron shop, in Drogheda, who refused to purchase so light and insignificant an article; it was subsequently bought by a watchmaker in the town, who, after cleaning and examining it, proceeded to Dublin, and disposed of it to Messrs. Waterhouse and Company for nearly as many pounds sterling as he had given pence for it; however, it has since been valued at £500.

The next brooch in Messrs. Waterhouse and Company's collection, in point of interest and workmanship, is the Dublin University Brooch, the delicate tracery of which, when closely examined, is found to be formed by the interlacing of the bodies and legs of animals, particularly the Irish elk. The original of this is in the Museum of Trinity College, Dublin.

The Arbutus Berry Brooch. The original of this is in the Royal Irish Academy.



The Arbutus Berry Brooch.



The Innisfallen Brooch.



Knight Templar Brooch.



centre piece presented by the Testimonial Committee to the Secretary, Mr. Parkinson, of which the annexed is an illustration, was designed especially for the Exhibition by this firm.

**660 SIMONTON, J.** 70 *Grafton st. Dublin*.—Mediæval mounted goods; jewellery; dressing cases; objects of art.

**661 AUBERT & LINTON,** 282 *Regent st. London, W.C.*—Parure of coral; artistic gold jewellery, &c.—See No. 330, Sect. X. (C).—(Nure.)

This suite of ornamental jewellery was an object of special interest to the ladies, especially those who were connoisseurs of coral—that wonderful insect deposit which has of late years risen considerably in the estimate of the fair sex. It seems, however, that a somewhat arbitrary standard of beauty has been established in regard to the colour of coral. We must no more think of a choice piece of coral when we talk of "coral lips" than we must of a bigareen when we speak of "cherry lips." Coral, to be rare and valuable, must be of a delicate pinkish hue, uniform in tint throughout, and in large pieces. This suite consists of nothing but such; and so rare is coral answering this description, that Signor Gismondi, the designer and carver of this set of ornaments, is said to have been twenty years collecting the pieces inserted therein. Of the carving of the coral into flowers and foliage, we need only say that it is as delicate as it is bold and deep, and sustains the reputation of the Italians for skill in glyptics. The suite consists of tiara, bracelets, solitaires, comb, earrings, brooch, necklace, and pendant, and is valued at £1,000, though the value is represented almost alone by the coral.

**662 VOTIERI, J.** 24 *Upper Park st. Barnsbury, London, N.*—Cameos carved in shell and onyx; brooches, &c.—(Roman Court.)

**663 JOHNSTON,** *Suffolk st. Dublin*.—Carved bog oak casket, mounted in gold, exhibited by permission of H. R. H. the Princess of Wales.—(Upper Central Hall.)

**664 AUSTIN, T. & G.** *Westmoreland st Dublin*.—Dressing cases.—(Nure.)

## SECTION XXIV.—GLASS.

### North End of Transept.

**670 DUBLIN GLASS BOTTLE CO.** *Up, Sheriff st. Dublin*.—Wine and porter bottles; claret and hock bottles; imperial quarts, pints, and half pints; soda-water and seltzer bottles, &c.—(Agricultural Hall, Kildare st.)

**671 CHANCE BROTHERS, & Co. Glass Works,** near *Birmingham*.—Crown, sheet, Chance's patent, coloured and ornamental glass; lenses; ship signal lights, baths, &c., for photography; propagating glasses; ecclesiastical window.

**672 COPELAND, W. T.** 160 *New Bond st. London, and Stoke-upon-Trent*.—Glass, richly cut and engraved, for table service and general decoration.

**673 GREEN, J.** 35 *Upper Thames st. St. Paul's, London, E.C.*—Chandeliers, candelabra, lustres; cut and engraved table glass.

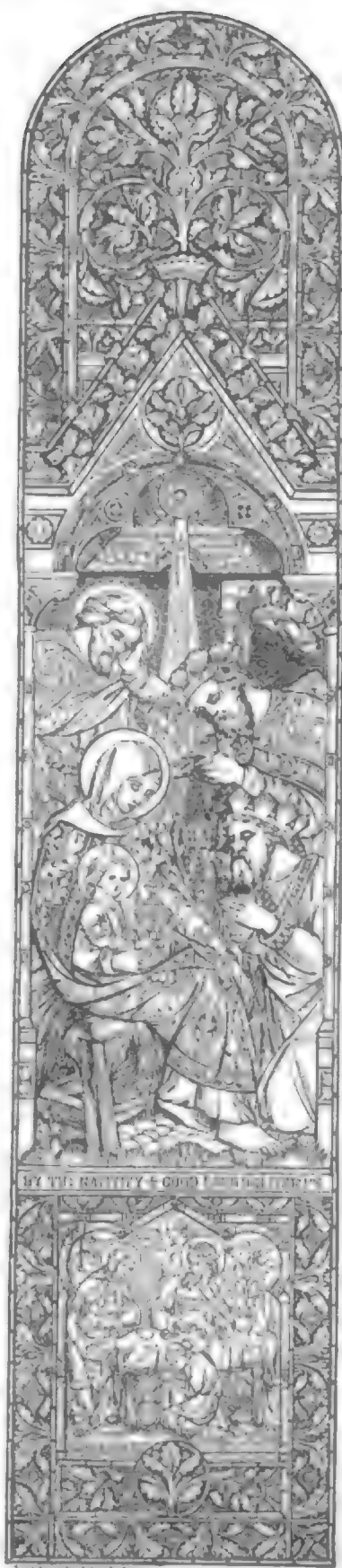
**675 PHILLIPS, W. P. & G.** 359 *Oxford st. and 155 New Bond st. London*.—Cut glass; engraved glass; plain glass; flower vases.

**676 POWELL, J. & SONS,** *Whitefriars Glass Works, London, E.C.*—Chandelier and candelabra; engraved, cut, jewelled, and plain glass; glass and porcelain for photography, &c.

**677 WORCESTER ROYAL PORCELAIN CO. LIMITED,** *Worcester*.—Cut glass dessert service; gaseliers; chimney lights; and ornamental table glass.

**678 LAVARS & BARRAUD,** *Endell st. London, W.C.*—East window of Clogher cathedral.—(South end of Gallery, over the staircase.)

**679 FORREST, J. A. & Co.** 58 *Lime st. Liverpool*.—Ecclesiastical window.—(South end of Gallery.)



One of a series of windows for apse of Garrison Chapel, Woolwich, made by Lavars and Barraud, Endell-street, London.



property, and after a week's sojourn, came to the conclusion that the district had sufficient of the necessary element to warrant the establishment of pottery works even of the very highest character, and that Belleek, a village on the property, was the proper place to erect such, the advantages of that locality being—

Unlimited water power, with a never-failing supply.

Water transit to Enniskillen and a number of towns, including Dublin, Newry, Belfast, Limerick, &c.

Its proximity to Ballyshannon, a seaport in the bay of Donegal, which is only three miles distance.

A sober, industrious people in and around the village.

The facility for getting down the felspar clays and the marls with which the surrounding district of Lough Erne abounds.

Mr. Armstrong having consulted with some of his London friends, entertained the idea of getting a Company formed to fully carry out the contemplated works, and a few gentlemen undertook to subscribe all the necessary capital. At this time he laid his views before his friend Mr. David M'Birney, of Dublin, who entertained the matter so spiritedly that he proceeded to London, and, with Mr. Armstrong, visited the Worcester Works, where Mr. Kerr not only gave every facility for investigation, but brought his commercial and practical skill to bear upon the enterprise, which, after the most mature consideration, he considered ought to become one of the staple manufactures of his native land.

Mr. M'Birney having visited the Castle Caldwell property, and the site at Belleek, selected by Mr. Armstrong for the pottery; and with that gentleman and Mr. Kerr, having carefully inspected the tract of country containing the felspar, &c., with that enterprise so characteristic of him, volunteered to find the whole of the capital, if Mr. Armstrong would join him, to *start* the concern, so as practically to introduce the pottery branch of industry into Ireland, and thus give the development of the mineral resources of that part of his native country a great and powerful impetus.

A sufficient portion of the works having been erected, a water-wheel of 100-horse power put up, built by Mr. Fairbairn, of Manchester, and the necessary crushing and grinding apparatus having been erected, and a couple of ovens, with the other required kilns built, about two years ago they began to manufacture the ordinary useful class of goods for table and toilet purposes; and the visitors of the Dublin Exhibition of 1864 had an opportunity of seeing the aptitude of the children for the pottery trade by the skill and dexterity evinced by the Belleek youth, who during the Exhibition were daily engaged in making jugs, &c.

In addition to this class of goods, Messrs. M'Birney and Armstrong have directed their attention and energies to the development of the application of machinery to the potter's art, and for the last two years have been producing, amongst other things, genuine porcelain insulators for the electric telegraph purposes, made by the unskilled labour of the district from the material in the state of nearly dry dust by pressure in metal moulds. These insulators contain 71 per cent. of the Castle Caldwell felspar and are in high estimation with the electrician. This means of manufacture will in time be found applicable to the production of a vast number of other articles. Mr. Armstrong has secured letters patent for an invention by which he is making the well known mortars and pestles of a most superior quality at a cost far below any process at present in use; jelly shapes, pomatum pots, and such class of goods can also be made with great ease, certainty, and economy.

The Belleek pottery at present employs about 70 hands of which number about 30 are boys and girls, learning the different branches of making ware, firing, dipping, printing, painting, lining, gilding, burnishing, &c. Even now the goods manufactured at Belleek have found their way and are in demand not only all through

Ireland, but in England and the United States of America. For the latter country the Belleek Works are eminently adapted to produce the suitable goods in such immense demand there. For their transit railway communication is established from Belleek to Londonderry, which latter boon to the district is to be attributed to the fact of the pottery works having been started in Belleek.

One of the most interesting facts connected with the Belleek pottery is, that its existence is fairly due and traceable to the Dublin Exhibition of 1853, and hence through it up to the Great Exhibition of 1851, and must undoubtedly be looked at as one of the many great and permanently practical results arising from the wisely considered project of the ever-to-be-lamented late Prince Consort.

NOTE.—From the great interest evinced by the visitors to the Exhibition in the display of ceramic goods manufactured by Messrs. M'Birney and Armstrong, we were induced, since the close of the Exhibition, to visit the Belleek Factory in the Co. Fermanagh, and found there, after a most careful investigation occupying some days, that the Pottery, now only in its infancy, from its numerous advantages will, beyond all doubt, take a prominent position amongst the manufactures of Great Britain. The practically unlimited supply of water-power, felspar, fire and other valuable clays; the great amount of skilled labour already created by the aptitude of the young people of the district, the facilities of transit by railway and water communication with the works; and the application of mechanical contrivances, clearly show that the small beginning of the present proprietors must, in time, prove a great commercial success. At the time of our visit, we found that not only were there large quantities of goods sent off daily to the different towns in England and Ireland, including London, but the orders on the books from the United States, Canada, and Australia, far exceeded what (of necessity) the limited resources of the factory could supply.

We understand a number of capitalists have expressed a desire to see this undertaking carried out by a company, on a large scale, commensurate with the local advantages it possesses, and with its national importance. We trust that the enterprise may prove not only a profitable investment to the promoters, but confer a permanent benefit on the country at large.

702 GREGG & SOX, 18 Sackville st. Dublin.—China and glass.

703 GOODR, T. & Co, 19 South Audley st. Grosvenor sq. London, W.—China.

704 M'CULLOCH, D. Dublin.—Pottery.—(Agricultural Hall, Kildare st.)

## CLASS D.—METALLIC, VITREOUS AND CERAMIC MANUFACTURES.

### JURY.

C. ATKINSON, Master Cutler,	-	Sheffield.
A. COPELAND, China Manufacturer,	-	London.
ISIDORE CORBIERE, Merchant,	-	France.
CORR-VANDERMAESEN, Commissioner for Belgium,	-	Belgium.
J. DIEFENBACH, Ass. Director of the R. Chamber of Commerce, Stuttgart,	-	Zollverein.
BARON DI DONNAFUGATA, Roy. Italian Commissioner,	-	Italy.
J. FRETWELL, Merchant,	-	Zollverein.
G. LUNGE, Ph. D., Chemical Manufacturer,	-	Zollverein.
J. R. KIRK, R.H.A., Sculptor,	-	Dublin.
C. PALORAVE, Belgian Consul,	-	Belgium.
ALFRED TYLOR, F.G.S., Brassfounder,	-	London.
J. WEST, J.P., Goldsmith and Jeweller,	-	Dublin.

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SECTION XXI.  
CUTLERY AND EDGE TOOLS.  
LIST OF AWARDS.  
MEDAL.

## UNITED KINGDOM.

- 591 GREENSLADE, E. A. & W. *Thomas st. Bristol.*—For planes.  
593 MARSHALL, S. *Globe Works, Sheffield.*—For patent scythes and hay-knives.  
594 MOGA, J. & Co. *Adelaide Works, Redditch, Worcestershire.*—For needles, fish hooks, and tackle.  
595 RODGERS, J. & SONS, *Sheffield.*—For cutlery.  
597 THOMPSON, J. 9 *Nassau st. Dublin.*—For steel goods and cutlery.  
600 BOULTON, W. & SONS, *Redditch.*—For needles and fish hooks.  
601 EADON, M. & SONS, *Sheffield.*—For saws, files, and edge tools.  
604 KING & PEACH, *Hull.*—For edge tools and planes.

## NOVA SCOTIA.

- 5 BILL & SKERRY. —For axes.  
61 STARR & SONS. —For skates.

## ITALY.

- 410 SELLA, LUDOVICO, & BROTHERS. *Masserano (Novara).*—For collection of cutlery.

## HONOURABLE MENTION.

## UNITED KINGDOM.

- 592 LEGGON, W. *Premier Works, Sheffield.*—For light and elastic forks.  
596 SUTTON, W. & SONS, 44 *Newtown row, Birmingham.*—For awl blades and packing needles.  
598 KIRBY, BEARD, & Co. 62 *Cannon st. West, London.*—For pins, needles, and fish hooks.

## CANADA.

- 53 EDGE TOOL COMPANY OF GALT, *Galt.*—For carpenters' tools.  
54 MOORE, T. *Etobicoke.*—For carpenters' tools.  
55 LEWIS, R. *Toronto.*—For skates, tools, &c.  
56 DAWSON, J. *Montreal.*—For carpenters' planes.

## SECTION XXII.

## IRON AND GENERAL HARDWARE.

LIST OF AWARDS.  
MEDAL.

## UNITED KINGDOM.

- 607 BROWN & GREEN, *George st. Luton, Bedfordshire.*—For progress in design of kitchen ranges, and for excellent workmanship.  
608 M'SHERRY, M. 10 *Bank place, Limerick.*—For a newly invented kitchen range.  
610 SMITH & WELLSTOOD, 7 *Capel st. and 74 Great Strand st. Dublin.*—For portable kitchen ranges and cooking stoves in Section XXII. Also for farm boilers and hot-water-pipe joints in Section IX.  
612 CHUBB & SON, 57 *St. Paul's churchyard, London.*—For excellence of workmanship and design in locks and safes.  
614 CRICHEY, H. & Co. *Sheffield Store-grate Works, Birmingham.*—For improvements and design in stove-grates, &c.  
615 DOLLAR, T. A. 56 *New Bond st. London.*—For horse-shoes for sound and diseased feet.  
617 EDMUNDSON, J. & Co. 33, 34, 35, & 36 *Capel st. Dublin.*—For progress and introduction of new and

useful apparatus, and for good manufacture of iron and brass work of different kinds.

618 EDWARDS, F. & SON, 49 *Great Marlborough st. London.*—For drawing-room, dining-room, and library grates.

620 FRANCIS, E. 1 *Camden place, Dublin.*—For horse-shoes.

622 GAS METER COMPANY (LIMITED), *Irish Meter Manufactory, Hanover st. Dublin.*—For dry gas-meter, and for the excellent Sanders' wet meter, manufactured by them in Ireland.

623 GLOVER, T. *Suffolk st. Clerkenwell green, London.*—For his patent dry gas-meters.

624 HOEY, T. & Co. 25 *New row, West, Dublin.*—For excellence of workmanship.

626 LAMBERT, T. & SON, *Short st. Lambeth, London, S.*—For their high-pressure water valves, pumps, &c.

629 PEYTON & PEYTON, *Bordesley Works, Birmingham.*—For excellence and economy in iron bedsteads.

630 SALTER, G. & Co. *West Bromwich.*—For their dynamometers, weighing machines, gauges, &c.

632 CHATWOOD'S PATENT SAFE AND LOCK CO. LIMITED, *Lancashire Safe and Lock Works, Bolton.*—For their fire-proof safes, locks, &c.; with special mention of the wedge-proof fastenings of S. Chatwood.

633 CURTIS, W. & SONS, *Chancery lane, and 99 Middle Abbey st. Dublin.*—For their water cocks, gas fittings, and railway carriage furniture, in Section XXI.; also for machine brasswork in Section V.

636 BOURNE, S. *Headstone Drive, Harrow, N.W.*—For his patent flexible diaphragm.

638 CLARK & Co. *Rathbone place, Oxford st. London.*—For their model of bay window, closed with patent self-coiling shutter.

639 JAMES, SONS, & AVERY, *King's Norton, and Bradford st. Birmingham.*—For their patent self-boring wood screws in brass and iron.

643 HODGES & SONS, 16 *Westmoreland st. Dublin.*—For their chimney-pieces, stoves, grates, &c., and for excellent iron and brass mediæval work.

644 RIDDELL & Co. *Belfast.*—For their mediæval brass and iron work, gas pendants, chandeliers, &c.

646 PATENT ENAMEL CO. 288 *Bradford st. Birmingham.*—For progress in the manufacture of enamelled iron.

647 SHERIDAN, J. 163 *Church st. Dublin.*—For his bell, safe, &c., in Section XXII.; also for his cottage windows in Section IX.

648 MURPHY, J. 14 *Thomas st. Dublin.*—For an excellent maiden peal of bells.

649 PHILIP, C. J. 20 *Caroline st. and 29 Mary st. Birmingham.*—For his gas lamps.

650 MEARS & Co. 267 *Whitechapel road, London.*—For their bells.

## CANADA.

57 PECK, J. *Montreal.*—For a good collection of nails, manufactured in the colony.

## NOVA SCOTIA.

62 SYMONDS, W. S. & Co. —For stoves manufactured of Acadian iron.

## AUSTRIA.

35 KOLBENHEIMER, E. 16 *Mittersteig, Vienna.*—For Britannia-metal wares.

36 MILLER, M. & SON, 26 *Webgasse, Vienna.*—For their pianoforte wire, cast steel rollers, and tools.

37 WERTHEIM, F. & Co. 11 *Tuchlauben, Vienna.*—For their fire-proof safes.

## BELGIUM.

134 CANIVET, J. B. *Atk.*—For his zinc letters.

135 DELLOYE-MABSON & Co. *Lacken.*—For their tinned and enamelled iron.

136 FAUCONIER-DELIBE, Ww. *Châtelet.*—For hand-wrought iron nails.

- 137 HOORICKX, G. *Brussels*.—For iron safes.  
 138 LAMBERT, W. W. *Charleroi*.—For rivets and bolts.  
 139 MATHYS-DEOLBRECK, J. P. *Brussels*.—For excellence of workmanship of his iron safe.  
 141 NICAISE, P. & N. *Marcinelle, near Charleroi*.—For bolts, screw-plates, and borers.  
 142 RAIKEM-VERDOBOIS, *Lidge*.—For excellence in manufacture of sheet iron.  
 143 TREMOUROUX, BROS. & DE BURLET, *St. Gilles, near Brussels*.—For their tinned and glazed iron ware.  
 144 VERLAINE, BROS. *Lidge*.—For their iron safe.

## ITALY.

- 414 BOLZANI, SAVERIO, 23 *Borgo di Cittadella, Milan*.—For his metallic wire gauze.

## ZOLLVEREIN.

- 77 STOBWASHER, C. H. & Co. *Berlin*.—For their lamps, bronzes and iron castings, japanned iron ware, &c.  
 78 LENNE-RUHR MINING & FOUNDRY CO. *Meggner, Altenkumden on the Ruhr, R.P.*—For their rough and finished iron.  
 80 SCHULTEN, F. *Duisberg, R.P.*—For his castings in copper.  
 81 SCHLENTER & CO. J. *Weissersühle, near Aie-la-Chapelle*.—For their cloth shearing machine, with cast steel spiral knives.  
 121 SEKRASS, A. R. & Co. *Offenbach-on-the-Maine (Hesse Darmstadt)*.—For his fancy articles of bronzed iron.

## HONOURABLE MENTION.

## UNITED KINGDOM.

- 609 KIDGELL, F. 103 *St. Hampton st. Birmingham*.—For his founders' models, brass and metal letters.  
 616 ECKLSTEN & WILLIAMS, *New Hall Works, George st. Birmingham*.—For excellence in pin manufacture.  
 621 GATCHELL, R. G. 7 *Dawson st. Dublin*.—For his beams and scales, &c.  
 627 LLOYD, M. *Charles Henry st. Birmingham*.—For his malleable nails.  
 634 FLETCHER, A. 10 *Lower Baginot st. Dublin*.—For his shower and other baths, japanned toilet sets, &c.  
 635 KENT, G. 199 *High Holborn, London, W.C.*—For his patent knife-cleaning machines and other utensils.  
 637 BRADY, F. & Co. *Pitzroy Works, Euston road, London*.—For their patent galvanized iron and zinc chimney flues, zinc sash bars, &c.  
 640 MURPHY, L. *Keyle Iron Works, 158 Church st. Dublin*.—For his wrought iron safe.  
 642 HINKS, J. & SON, *Birmingham*.—For their patent fumivore lamps.  
 619 HAGGIE, BROS. *Gateshead-on-Tyne*.—For metal cords and lightning conductors.  
 650A WINSTANLEY & JEPSON, 36 *Corn market, Dublin, and Salt market, Glasgow*.—For their clogs, clay irons, &c.

## AUSTRIA.

- 34 BODE, F. M. 7 *Franzenegasse, Vienna*.—For his patent coffee roasters, &c.

## BELGIUM.

- 133 BAYARD, M. *Herstal, near Liege*.—For his coach wrenches, compasses, bolts.

## FRANCE.

- 87 DUFONT, PH. *Cherbourg*.—For his metal varnish, coffee and pepper mills.  
 88 TROCARD, T. *Paris*.—For improved coffee-pot.

## ITALY.

- 413 ABUNDO, GIOVANNI, *Salerno (Principato Citeriore)*.—For his safety-lock.

## SECTION XXIII.

WORKING IN PRECIOUS METALS AND IN THEIR IMITATION;  
 JEWELLERY AND ALL ARTICLES OF VERTU AND LUXURY,  
 NOT INCLUDED IN OTHER CLASSES.

NOTE.—In this Section (XXIII.) the firm of CARLHIAN AND CORBIÈRE (*France—90*) is precluded from receiving award, in consequence of Mr. Isidore Corbière being a member of the Jury.

## LIST OF AWARDS.

## MEDAL.

## UNITED KINGDOM.

- 651 BARKENTIN & SLATER, 291 *Regent st. London, W.*—Vases in oxydized silver, decorated with groups of figures, in repoussé work.—For good design; elaborately worked, and well finished.  
 663 JOHNSON, J. 22 *Suffolk st. Dublin*.—Carved bog oak casket, mounted in gold, and heraldic book-cover; For excellence of design and elaborate carving of great merit.  
 664 AUSTIN, T. & G. *Westmoreland st. Dublin*.—Dressing cases, writing desks of good manufacture and good commercial value.

## AUSTRIA.

- 23 NEIBER & BREITER, 14 *Lindengasse, Vienna*.—Fancy articles in leather; for excellence in manufacture.  
 24A KLEIN, A. *Andreasgasse, Vienna*.—Fancy articles in leather, wood, and bronze; for excellence in the finish of his ormolu productions, and general merit of exhibition.

## BELGIUM.

- 148 SANDOZ, V. *Brussels*.—Casket in engraved silver; good engraving and finish.

## FRANCE.

- 89 BLOT & DROUARD, *Paris*.—Ornamental articles in zinc, imitating bronze; for variety of design and progress in the finish and productions of zinc.  
 91 HOTTOT, *Paris*.—Ornamental articles in zinc, imitating bronze; for variety of design, good workmanship, and general merit of collection.  
 92 MIROY, BROS. *Paris and London*.—Bronzes; for good design and well-finished figures in zinc.  
 97 BOY, *Paris*.—Ornamental articles imitating bronze; for excellence of design and manufacture.  
 99 BARBÉDIENNE, F., *Paris*.—Bronzes.—For excellent reproduction, in bronze, of the works of the highest artistic merit, and also for introduction of enamel with ormolu ornaments.  
 100 BARBÉAT, *Val d'Osne*.—Cast-iron statues, vases, &c.; two monumental fountains in the gardens; for excellence in moulding and casting of ornamental iron work of great merit.

## ITALY.

- 436 STELLA, GIOVANNI, 12 *Vico 2° Moncalario, Naples*.—Engravings on lava from Vesuvius; good execution.

## ROME.

- 15 DIES, GIOVANNI.—Mosaics, views of Rome, &c., for excellence of execution.  
 16 SAULINI, Cav. LUIGI.—For great excellence in the workmanship of cameos.  
 20 VESPIGNANI, RAFAELLO.—Bas relief, in ivory; exquisite work.  
 22 GIRAUD, His Excellency DOMENICO, *Steward and Secretary of the Building of St. Peter, President of the Mosaic Works of the Vatican*.—For perfect reproduction of pictures in mosaic.

**25 FERRARI**, His Excellency Monsignor GIUSEPPE, *Treasurer-General and Minister of Finance to His Holiness Pius IX.*—For great excellence of finish of bronze medals.

**26 THE SAVORELLI PATRIMONT.**—For originality and novelty in inlaid stone.

**28 ANTONELLI**, His Excellency CARDINAL GIACOMO. —For excellence of cameo.

**29 PINET, ERNEST.**—Collection of cameos, intaglios, &c., beautifully executed.

**ROMALSKY & CARNESECHL.**—For vases of great excellence.

#### HONOURABLE MENTION.

#### UNITED KINGDOM.

**655 BELL, BROR**, 15 *Grey st. Newcastle-on-Tyne.*—Two specimens of aluminium work; good design.

**657 FLAVELLE, H. E.** 43 *Grafton st. Dublin.*—For a model of the Ark of the Covenant.

**659 WATERHOUSE & Co.** 25 *Dame st. Dublin.*—For Tara brooch from the Irish antique.

#### BELGIUM.

**147 HOKA, A.** *Liège.*—For merit of engraving on platinum.

#### FRANCE.

**LAMBIN & Co.** *Paris.*—For imitation in zinc, of good design, of cups and vases.

#### ITALY.

**424 BEUCCI, GIUSEPPE**, *Florence.*—For large collection of serpentine work.

**425 BILLOTTI, DR. PIETRO**, 1 *vicolo del Gianduia, Turin.*—For good workmanship in water-colour miniature paintings on marble.

**428 CERIANI, & BROTHERS BARZAGHI**, 6 *via della Moscova, Milan.*—For bronzes; good workmanship.

**429 ERCOLANI, E.** *Florence.*—For good workmanship in repoussé metal work.

**432 LAUDICINI, GIUSEPPE**, 268 *Riviera di Chiaja, Naples.*—For good workmanship in cameos engraved on Indian shells.

**435 MUSSOLINO, SALVATORE**, 19 *Vico Colonna a Pontenuovo, Naples.*—For good workmanship in sculptured wooden vases, ornamented with figures.

#### ROME.

**19 BARBERI, COM. M.A.**—For variety of mosaic.

**21 RICCARDI, LUIGI.**—For mosaic tables.

**24 BARZETTI, BIAORO.**—For several mosaics.

**27 SAULINI, CAV. LUIGI.**—For his mosaic picture.

#### ZOLLVEREIN.

**122 WUNSCH, J. B.** *Nürnberg.*—For gold and silver embroideries, good and well-made.

#### SECTION XXIV.

##### GLASS.

#### JURY REPORT.

THE Jurors commend, with the highest terms of praise, the display of useful window glass for signal lights, &c., exhibited by the well-known firm, Messrs. Chance, Brothers, of Birmingham. This firm, and also that of Messrs. Powell, of Whitefriars, have sent some beautiful specimens of stained glass to this Exhibition. The last-named have introduced, most successfully, pieces of glass of tints acquired by accidental causes, which show to great effect. The glass for useful purposes, as exhibited by the "inventors," Messrs. Green, of Thames st., and Messrs. Phillips of Bond st. London, is of the highest character. The delicate manipulation of the engraved designs are inexpressibly beautiful.

The firm of W. T. COPELAND, 160 *New Bond st. London, W.*, exhibit cut glass table services and specimens of engraving on glass of great merit; but in consequence of Mr. Alfred Copeland being a member of the jury, is precluded from receiving an award.

#### LIST OF AWARDS.

##### MEDAL.

#### UNITED KINGDOM.

**671 CHANCE, BROTHERS, & Co.** *Glass Works, near Birmingham.*—For crown, sheet glass, ship signal lights, &c.; and stained window.

**673 GREEN, J.** 35 *Upper Thames st. St. Paul's, London, E.C.*—As inventor, for useful glass for domestic and ornamental purposes; cut and engraved glass of the highest excellence; and a chandelier of beautiful proportions and exquisite design.

**675 PHILLIPS, W. P. & G.** 359 *Oxford st. and 155 New Bond st. London.*—As inventor, for useful table glass in great variety; beautifully engraved subjects of ferns, figures, and borders upon most classical-shaped vases, ewers, &c.

**676 POWELL J. & SONS**, *Whitefriars Glass Works, London, E.C.*—For metal of excellence, good cutting; glass for photographic purposes, and for a stained glass window of the highest merit.

**678 LAVERS & BARRAUD**, *Endell st. London, W.C.*—For a stained glass window of singular attraction.

#### AUSTRIA.

**41 BRAUN, H. 1 & 2 Queen's Head Passage, Newgate st. London.**—For a large variety of coloured glass, of merit.

#### BELGIUM.

**149 BENNETT & BIVORT, Jumet.**—For window glass of excellence.

**150 DE DOBLODOF DE MORIANÉ, AINÉ & FILS**, *Lodelinsart.*—For window glass.

**153 MONDRON, L.** *Lodelinsart.*—For window glass.

#### ZOLLVEREIN.

**82 OIDTMANN, DR. H. Linnich, near Linden, R.P.**—For stained glass windows prepared by a lithographic process at a most moderate cost.

#### HONOURABLE MENTION.

#### CANADA.

**58 M'CAUSLAND, J.** *Toronto.*—For stained glass window of merit.

#### AUSTRIA.

**43 REICH, S. & Co.** *Langenau, near Haida, Bohemia.*—For glass decorated with novel designs and good colouring.

#### BELGIUM.

**151 DE KEGHEL, J.** *Brussels.*—For stained glass.

**152 LEDOUX, J. B.** *Jumet.*—For window glass.

#### SECTION XXV.

CERAMIC MANUFACTURE, CHINA, PORCELAIN, EARTHENWARE, ETC.

#### JURY REPORT.

CONSIDERING the extraordinary facilities offered by the promoters of the Dublin Exhibition to all foreign nations (that the whole of the expenses of transit were defrayed by them, and attendants provided during the period the building is open, &c.), it is a matter of some regret to the jurors that the exhibitors come before them in such a limited number. We feel sure that Dresden, Berlin, St. Petersburg, and Copenhagen, could have been worthily

represented, and we are sorry to think that these Imperial manufactories exhibit nothing. The Imperial manufactory of Sèvres presents to the public some marvellous specimens of ceramic art of the greatest attraction. We cannot be unmindful of the contributions of the leading English firms—Messrs. Minton and Mr. Copeland—who have in the Exhibition works of the highest merit, presenting great originality; and their respective efforts have been attended with the most happy results, as regards the purity and richness of decoration, in the colours, glaze, gilding, &c. The collection of Mr. Alderman Copeland forms an exhibition of a most comprehensive character, consisting of a series of works in all the leading branches of the manufacture; especially flower and landscape painting, upon forms and shapes of great purity and originality, and ceramic statuary, as exemplified by reproduction from the models of the most noted sculptors of the age. Mr. Alfred Copeland having accepted the office of Juror, the firm of W. T. COPELAND, 160 New Bond st. London, was precluded, according to the rules of the Executive Committee, from receiving the medal which would have been otherwise awarded it. Messrs. Minton's productions are shown to great advantage by several exhibitors, and principally by Messrs. Goode and Messrs. Phillips. The collections of these firms are most admirable: that of T. GOODE & Co. London (United Kingdom), consists exclusively of Messrs. Minton's manufactures.

Gladly do we record the most deserving commendation on the useful and ornamental exhibits of purely Irish manufacture. The attention of the jurors was particularly directed to the stand of Mr. Fischer, in the Austrian Department, whose wonderful imitation of oriental porcelain deserves great praise. Mr. Bucker and Mr. Meyer, on behalf of Saxony, have sent some beautiful reproductions of the pictures of the Old Masters in the Dresden Gallery. Mr. Meyer has included in his exhibits some clever, skilful, and meritorious designs for dessert services in the old Dresden style. The "free hand" painting of Mr. Demol of Brussels cannot fail to attract attention, and the clay pipes from the Netherlands are most worthy of notice.

#### LIST OF AWARDS. MEDAL.

##### UNITED KINGDOM.

**677 WORCESTER ROYAL PORCELAIN COMPANY, LIMITED, Worcester.**—For meritorious works of varied character; porcelain vases; careful potting; flower painting, and "ivory" ware.

**693 HILL POTTERY COMPANY, LIMITED, Burslem, Staffordshire.**—For collection most comprehensive in its character; Majolica vases, porcelain of great merit, and figure painting.

**698 CLIFF, J. & Co. Imperial Potteries, Lambeth, London, S.**—For stone-ware fabrics of colossal proportions, and assortment of the useful productions for which Lambeth is generally and justly celebrated.

**701 M'BIRNEY & ARMSTRONG, Belleek, Co. Fermanagh.**—Pure Irish manufactured goods in earthenware and Parian—deserving of the highest commendation.

**761 BLASHFIELD, J. M. Wharf-road, Stamford, Lincolnshire.**—Fine terra cottas for architectural purposes; garden vases and stork fountain; a grand exhibition of works in a "body" that will stand the test of out of door weather to perfection.

##### AUSTRIA.

**46 FISCHER, M. Herend, Veszprim, Hungary.**—For an exemplary display, in great variety, from Sèvres, Dresden, and Oriental models; careful potting and good colouring.

##### BELGIUM.

**155 DEMOL & SON, Brussels.**—For paintings after the Old Masters, in a free, skilled manner, upon specimens of English pottery.

##### FRANCE.

**101 IMPERIAL MANUFACTORY OF SÈVRES.**—For its magnificent display of vases and works of art; the colours, rich gilding, delicate manipulation, and treatment of the designs upon "Pâte Tendre," "Celadon," &c.

##### ITALY.

**442 BONI, & ANDREA, 8 fuori Porta Garibaldi, Milan.**—For grand examples in terra cotta. A Faun and Bacchante are remarkable for their large proportions and exemplary modelling.

**446 GIUSTINIANI, ANGELO, 20 Strada Gigante, Naples.**—For Majolica vases in the Urbino style, of high merit.

##### NETHERLANDS.

**50 PRINCE, JAN. & Co. Gouda.**—For clay pipes.

**51 WANT, AZN. P. J. VAN DER, Gouda.**—For tobacco.

##### ZOLLVEREIN.

**126 BUCKER, H. Saxony.**—For paintings on porcelain from originals in the Dresden Gallery, particularly those after Guido, Koninx, &c.

**127 MEYER, M. Saxony.**—For paintings on porcelain from the Old Masters, and for services of dessert, tea, &c., of great merit, design, and colour.

**128 WUSTLICH, OTTO, Munich.**—For careful enamelling of pictures from the Old Masters in the Gallery.

##### HONOURABLE MENTION.

##### BELGIUM.

**154 BARTH, D. Andenne.**—For clay smoking pipes.

##### ITALY.

**449 MOLICA, GIOVANNI, 27 Strada Sta. Lucia a Mare, Naples.**—For terra cotta ware.

**454 SPREAFICO, BROS. 12 Cordusio, Milan.**—For decorated earthenware.



*London.*—Furniture in the style of XVI.; duchess writing table; princess table; chalet chairs carved and gilt; easy chairs, &c.

719 ROSS & CO. 8 *Ellis' quay, Dublin.*—Camp furniture, portmanteaus.—(*Hut at N.W. Entrance to Gardens.*)

720 JONES, A. & SON, 135 *St. Stephen's green, Dublin.*—Sideboard of Domingo mahogany; curtains; chairs; Saxe Gotha, Axminster, and other carpets.

721 M'DOWELL, H. 52 *Mary st. Dublin.*—Gilt pier table; walnut chiffoniere; mahogany sideboard; walnut ottoman and easy arm chair; lady's chair.

722 SEDLEY & CO. *Burlington Furniture Galleries, 38 Conduit st. W. London.*—Patent equilibrium chairs; silver plated, brass, and iron chairs; wood carved ditto.

723 STEINHOFFER, Miss F. 348 *Hanover st. Edinburgh.*—Table top of white marble, painted from nature (Mosaic work); slab ditto.

724 STRAHAN, R. & CO. 24 *Henry st. and 5 Leinster st. Dublin.*—Cabinet in Italian style; console table in the style of Louis XV.

725 TAYLOR, J. & SON, 109 *Prince's st. Edinburgh.*—Sideboard in pollard oak.

726 TROLLOPE, G. & SONS, *Halkin st. West, Belgrave sq. (late of Parliament st.) London.*—Ebony cabinet.—(*Nave.*)

727 TUDSBURY, R. & SONS, *Edwinstowe, near Ollerton, Nottinghamshire.*—Carvings from nature in lime-wood; carved brackets and tables in brown oak.

728 WOOLLAWS, W. & CO. 110 *High st. near Manchester sq. London, W.*—Medieval and other paper hangings.

729 ALEXANDER, S. 121 *George st. Limerick.*—Furniture.

730 ANNOOT, C. 16 *Old Bond st. London.*—Buhl cabinet in the style of Louis XIV.; bronze and ormolu candelabra; tables, and other fancy furniture.

731 DEAREN, T. F. 13 *Soho sq. London, W.*—Console table, with statuary marble top, supported by bust of angela, surmounted by carved and gilt frame, with glass.

732 JACKSON & GRAHAM, 29, 33, 34, 35, 37, and 38 *Oxford st. London.*—Mural decoration; cabinet furniture and bronzes.—(*West side of Transept.*)

734 BRUNSWICK BROTHERS, 72 *Newman st. Oxford st. London.*—Amboyna cabinet, style of Louis XVI.; pair of Bonheur de jour, in satinwood, in the style of Louis XVI.; portefeuille bureau; chairs; flower stands.

735 FRY, W. & CO. 31 *Westmoreland st. Dublin.*—Carved and gilt Gothic furniture and interior decorations; gilt bronze lamps and stands, &c.

The furniture department of Messrs. Fry's factory is by no means the least interesting. About forty cabinet makers and carvers are employed, and the work turned out is of the very finest description. Of late several novelties have been introduced in the mode of inlaying. The inlaying is associated with gilding, several new combinations of different coloured woods have been introduced, and the effect is really elegant and artistic. All articles of furniture, console tables, cabinets, chairs, are made to order, and the ability of the designers employed by the firm in other branches of their business is quite equalled in this. Some of the finest sideboards ever made are shown in the establishment in Westmoreland-street; and the tables are, each in their kind, perfect specimens of artistic workmanship. Several very clever carvings, imitating fruits and flowers, are worthy of notice, and the gildings are remarkable for neatness and good taste. In all cases harmony of colouring is carefully attended to. The large establishment, formerly occupied by Mr. Boswell, on Bachelor's walk, contains an extraordinary variety of the choicest decorations. The best kinds of paper and ornamental borders are procured from France, but they are combined and arranged in the most tasteful manner by the Messrs. Fry. Several screens, displaying rare designs of the

Etruscan, the Alhambresque, the Persian, and the Renaissance style, are tastefully designed and carried out, and in most cases a fine effect is produced by the association of colours, and the use of ornamental borders. The painting and gilding of what is known as "flock paper" deserves to be mentioned, although it is not easily described. Some papers in imitation of oak are admirable, for the best of all reasons, because the grain is obtained by printing from blocks of the wood itself.

The visitors to the late International Exhibition will not forget the beautiful stall occupied by the Messrs. Fry, and so favourably noticed by the Prince of Wales and other distinguished strangers. But their establishment in Westmoreland-street is an exhibition in itself. No material used in the decoration or the furniture of a house is omitted. The most exquisite poplins, plain and figured, are displayed in extraordinary variety, and the various parts of the house are not only largely stocked, but arranged with a careful eye to effect. The trade is gradually increasing. The receipts become larger every year, and the number of persons in the establishment is proportionately enlarging. Even now the wages paid in the factory amount to about £500 per week, and as there is always a large demand for skilled labour it is impossible to over estimate the beneficial effect exercised upon those trades in which the Messrs Fry find their artizans. Reference has already been made to a new wing which is being erected on the east of the factory. This is by no means the only improvement contemplated, and as the ground gives ample room for additional buildings, it is to be hoped that before long the business will have prospered to such an extent that the entire space will be occupied, and the number of persons employed will be doubled. There is no hindrance to success. The English and foreign markets are open to Irish competition, and so large an investment of capital as this establishment evidences is certain of being rewarded with liberal profits.

By way of example, the success which has been attained by the Messrs Fry deserves to be quoted. It has been prosperous because, not content with bringing a well-known Irish manufacture to the highest possible perfection, the members of the firm have endeavoured to naturalize branches of trade of which for too long a time Ireland has been ignorant. And not less are they entitled to credit for the admirable taste which is displayed in all their productions, and for the high order of skilled labour which they employ. It is said that Irishmen possess a peculiar gift for design. In the branches of manufacture, exemplified at the Kevin-street factory, there is an ample field for this order of talent.

Schools of design are most useful, not when they produce mediocre painters and sculptors, but when they raise the standard of decorative skill, when they help to refine taste and stimulate the better class of industrial occupations, and, finally, when the pupils whom they produce can find an immediate market for their abilities. Such establishments as that of the Messrs. Fry afford the largest scope for clever designers and workmen, and the keener the competition in the trades which they employ, the larger will be the measure of success attained.

736 HEYWOOD, HIGGINBOTTOM, SMITH & CO. (LIMITED), 15 *Parliament st. Dublin.*—Paper-hangings.

737 PURDIE, BONNAR, & CAUFAR, 77 *George st. Edinburgh.*—Wall decoration in the Italian style.

738 ROWLEY, C. *Bond st. New cross, Manchester.*—Mouldings, &c.; picture frames, and imitation ormolu miniature frames.

739 WHITLOCK, R. & CO. 9 and 11 *George st. Edinburgh.*—Engraved and illuminated ash bedroom furniture (registered and trade marked).

740 BYRNE, J. J. & SONS, 6 *Henry st. Dublin.*—Furniture.

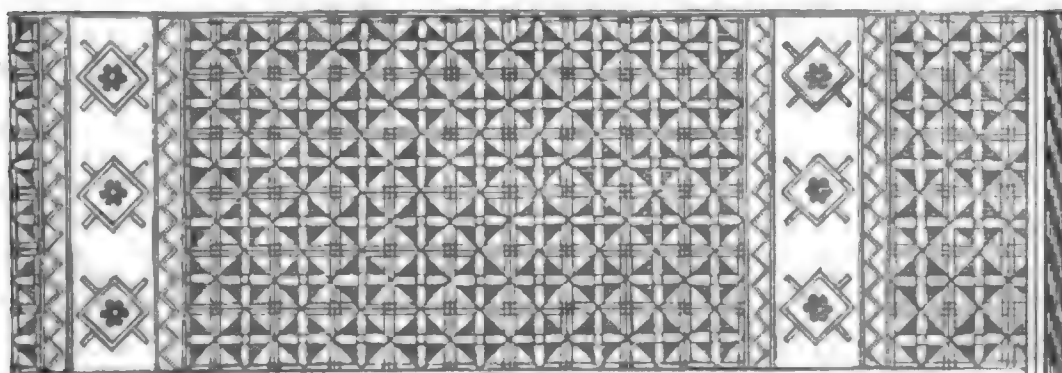
741 BOYLE, R. B. JUN. *Marlborough st. Dublin.*—Wood carving.

742 CRACK, J. G. 14 *Wigmore st. London, W.*—Furniture and decoration.

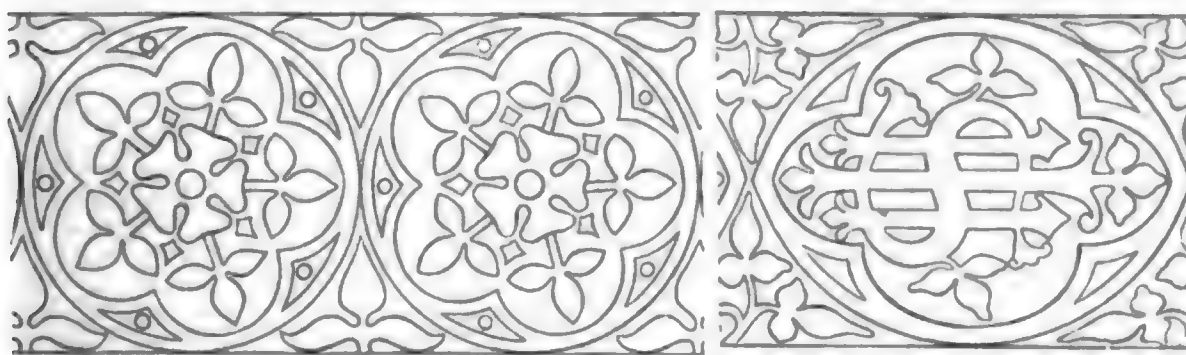








Hanging.



Woven Lace.

**756 HARLAND & FISHER, 33 Southampton st. Strand, London, W.C.**—Works of decorative art.

**757 FIELD & ALLAN, 27 Frederick st. Edinburgh.**—Ornamental heraldic hall window in "Cinque cento" style; same in Italian renaissance style.

**758 CHANCE BROTHERS, & Co. Birmingham, Ecclesiastical window.**—(See p. 300 for illustration.)

The Messrs. Chance, of Birmingham, have long occupied a leading position in the glass trade; and at any of our Exhibitions they have not been satisfied to contribute merely the common articles. Their Dioptric Lighthouse Apparatus, which occupied so prominent a position in the Central Hall of the Dublin Exhibition of 1853, will be in the recollection of many of our readers. On the present occasion they exhibit their famous Robin Hood Window, which attracted so much attention at the Exhibition of 1862, as a clever work of art, and as an excellent specimen of manufacture.

The design of the window is taken from the following verses of the well-known ballad, the legend being inscribed beneath the picture:—

**ROBIN HOOD'S LAST SHOT.**

"Yet he was beguiled, I wis,  
By a wicked woman,  
The Prioress of Kirkleys,  
That nigh was of his kin.  
For the love of a knight,  
Sir Roger of Doncaster,  
That was her own special,  
Full evil may they fare!"

"Give me my bent bow in my hand,  
And a broad arrow I'll let flee.  
And where this arrow is taken up,  
There shall my grave digged be.  
Lay me a green sod under my head,  
And another at my feet;  
And lay my bent bow at my side,  
Which was my music sweet.  
And make my grave of gravel and green,  
As is most right and meet."

As a piece of elaborate and highly-finished ornamentation, this window is deserving of the highest commendation. In the minutest details there is a degree of careful treatment to challenge admiration; and they are all made subservient to the illustration of the leading object. The colouring, too, is rich and brilliant; and we can scarcely doubt that familiarizing the public with such examples would lead to the more general use of this kind of glass for the halls and vestibules of mansions, where those grand effects could be seen which are now only associated with ecclesiastical art.

**759 PRICE, H. G. 11 Gower place, Euston sq. London, W.C.**—Panel carved in oak, for pulpit; panels carved in oak (natural foliage).—(South side of Nave).

**760 AMHERST, W. A. T. Diddington Park, Norfolk.**—Egyptian Antiquities:—

2. Sphinx, formerly in the collection Mimant.
  3. One of the genii of Amenti Amaot, with human head
  - 4, 5, 6. Genii, viz.:—Of Amenti Hapi, with head of the Cynocephalus ape; of Amenti Smantf, with jackall's head; of Amenti Kebhnsnof, with hawk's head.
  7. Head of Berenice, wife of Ptolemy I., fragment of a statue placed by Ptolemy Philadelphus at the tower of Berenice, on the shore of the Red Sea.
  8. Head of Arsinoe, daughter of Ptolemy I.
  9. Head of a queen, in green basalt.
  10. Head of an Egyptian, in jasper.
  11. Cartouch of Cleopatra, last Queen of Egypt, brought from a small temple opposite Kalabsho, in Nubia.
  - 12 to 20. Bronze figures: Osiris; Isis nursing Osiris; Buto; Paht; a Priest; a cat sacred to Paht; the god Nilus; a king kneeling in adoration.
  21. Mummied figure, a form of Osiris, in porcelain.
  22. Bronze figure of the Apis, or Sacred Bull.
  23. Mummy of cat.
  24. Seal or stamp in burnt clay, bearing the cartouch of Tirhaka, King of the Ethiopians.
- 760A JODI, SIGNOR, Reggio in Emilia, Italy.**—Collection of antiquities in bronze, delft, and ivory. The



## SECTION XXVII.—MANUFACTURES IN MINERAL SUBSTANCES, USED FOR BUILDING OR DECORATION.

## North-west Transept.

**761 BLASHFIELD, J. M.** *Wharf road, Stamford, Lincolnshire.*—Vases executed for Her Majesty the Queen; copies of the Warwick, Townley, and other vases; tazzas and fountains; statuettes, busts, &c.; architectural cornices, capitals, tracery, &c.

**762 HISSON, R.** *85 Talbot st. Dublin.*—Marble drawing-room chimney piece.

**763 McCULLOUGH, D.** *Marble and Stone Works, Armagh.*—Chimney piece, and pedestal for a bust, of Armagh marble.—(Under North Staircase.)

**764 MACDONALD, FIELD, & Co.** *Granite Works, Aberdeen.*—Red, grey, and blue granites, used in architectural construction, decorations, &c.

**765 MAW & Co.** *Benthill Works, Brosely.*—Geometrical and pictorial mosaic encaustic tile pavements, and majolica tile wall decorations.

**766 SHEPPARD, S.** *28 Lower Ormond quay, Dublin.*—Chimney piece in statuary marble.

**767 GARNKIRK FIRECLAY CO.** *Buchanan st. Glas-*

*gow.*—Terra cotta garden flower pots, plain and ornamental.—(In the Garden.)

**768 MAGNUS, G. E.** *39 Up. Belgrave pl. Pimlico, S.W.*—Chimney pieces and other works in enamelled slate.

**769 ROWAL, KYEAN.**—Altar piece.—(Agricultural Hall, Kildare st.)

**770 ROSHER, F. & G.**—Garden vases; ornamental figures.—(West Verandah and Garden.)

**771 FIELD & ALLAN, 27 Frederick st. Edinburgh.**—Dining-room and library chimney pieces.

**772 FISHER, L. & T. & DYSON, Huddersfield.**—Ornamental terra-cotta vases and pedestals; garden fountains; flower boxes; stands, &c.

**773 BLASHFIELD, J. M.** *Wharf road, Stamford, Lincolnshire.*—Greek and Etruscan stone wares; Greek and Etruscan vases.

**773A M'ANASPIE, P. & T.** *31 Great Brunswick st. Dublin.*—Pig in plaster; Scagliola table.—(Agricultural Hall, Kildare st.)

## SECTION XXVIII.—MANUFACTURES FROM ANIMAL AND VEGETABLE SUBSTANCES, NOT BEING WOVEN OR FELTED OR INCLUDED IN OTHER SECTIONS.

## North Gallery of Nave.

**774 GONNE, Mrs.** *26 Clare st. Dublin.*—Wax flowers; illuminations.

**775 HEINRICH, J.** *39 Lower Kennington lane, London, S.*—Tortoise-shell combs and tortoise shell.

**776 HOPKINS, Mrs. J.** *39 Great Brunswick st. Dublin.*—Paper flowers, illuminations, &c.

**777 INDIA RUBBER, GUTTA PERCHA, AND TELEGRAPH WORKS CO. (LIMITED), Silvertown, Essex; Persian-Beaumont and St. Denis, France; and Menin, Belgium.** Articles in India rubber and gutta percha.

Caoutchouc exists exclusively in what is termed the "milk sap" or "juice" of plants, varying in quantity with the plant yielding it, and its geographical position in the tropics. Plants yielding this milk-sap are doubtless to be found on every portion of the earth's surface, obeying the general law governing vegetable life—viz., increased productiveness in proportion to their vicinity to the tropics. Humboldt, in the first edition of his "Aspects of Nature," notices this fact, "that the milk-juice of plants increases as they approach the tropics."

Caoutchouc, on the whole, is a substance far more widely diffused among plants than is generally considered. In addition to the two chief families which yield the caoutchouc of commerce, the Artocarpacæ and the Euphorbiacæ, caoutchouc has been found in the sap of plants belonging to the Cichoracæ, Lobeliacæ, Apocynacæ, and Asclepiadacæ. Referring to the former, the Indian caoutchouc is principally obtained from the natural family Artocarpacæ; whilst the American is derived from trees classed among the Euphorbiacæ. The chief source of the "East India" or "Java rubber," large quantities of which have during late years been imported into this country, is the *Ficus elastica*, known also as the Assam caoutchouc tree. The *Ficus elastica*, again, belongs to a family of plants which yield in abundance a milky juice, possessed of various and singular properties in common with the hydro-carburet emulsion of the order Euphorbiacæ. This

remarkable tree is described as attaining the size of an English sycamore, although it is frequently met with of gigantic proportions. Trees have been found to measure 50 to 100 feet in height, whilst the area covered by their expanding branches has exceeded 150 feet in diameter.

The *Ficus elastica* is also indigenous to Assam, in the districts between the Burraimpooter and the Bootan hills. It has a preference for rocky chasms, where its roots are plunged among the debris of mountains and vegetation. It has been calculated from authentic surveys that there are from forty to fifty thousand trees of this class within a length of 30 by 8 miles of forest near Ferozepoor, in the district of Chardwar, in Assam; and so far as has yet been determined, the geographical range of the tree in that country is between 25 deg. 10 min and 27 deg. 20 min. North latitude, and 90 deg. 40 min. and 95 deg. 30 min. East longitude. It is a tree growing with great rapidity, attaining a height of 20 to 30 feet in a growth of five years only. Its leaves are well formed, smooth, polished, and of a lustrous green.

In addition to the *Ficus elastica*, India has other trees also yielding caoutchouc. We may quote the jack tree, *Artocarpus integrifolia*; the banyan tree, *Ficus indica*; and the pippala tree, *Ficus religiosa*. Eastward of Bengal other sources have been discovered; the Luti Aru, a description of climbing apple, called Sadal Kowa, abounds in a milky sap containing a large proportion of caoutchouc. The *Urceola elastica*, first described by Dr. Roxburg as the chief source of caoutchouc in India, yields it in great abundance.

The late Dr. Royle, who specially studied this question, states, that in the East "there might be any quantity of the article procured from a great variety of plants, if the natives could only be induced to collect it with sufficient care."

The American caoutchouc is chiefly obtained from a tree belonging to the Euphorbiacæ family, and named



are exposed either to the heat of the fire or the sun. When dry, they are again dipped, and so on until the coating of the caoutchouc attains a thickness varying from one to two inches. The moulds are then broken, and the pieces removed through the neck, leaving the solid coating or envelope—the crude “bottle” or “Para” India rubber of commerce.

Having so far traced the principal sources of caoutchouc, we will briefly glance at the part of the caoutchouc trade which tells of thirty-five years' uninterrupted manipulation of this singular gum; during which period vast transactions have been conducted and carried out in it, while a knowledge of many of its most valuable properties and features has been obtained. Application has followed application, and invention succeeded invention, in an astounding manner—so readily has this elastic substance accommodated itself to the necessities and requirements of the age it has passed through; and in this respect it may be said to stand unrivalled by any similar product. At no former period of its history has this material stood forward so prominently and conspicuously as at the present day, and never have its peculiar properties been so fully appreciated or universally admitted. But, great as are its known advantages, they cannot fail to be multiplied to an unlimited extent, as science aids in the discovery of mechanical and chemical means to apply it to the daily increasing wants which it alone is capable of fulfilling. Its past applications, worthy of note as materially benefiting the progress of the age have been chiefly mechanical; but a new era has dawned, in which knowledge is everywhere unfolding and lending her aid towards development and progress. Steam, which has already worked such mighty changes in civilization and the commerce of nations, is largely indebted to caoutchouc as supplying a want in engineering appliances incapable of being made good by any other material, not excepting metal itself.

778 ISAACS, J. & Co. 15 *Nassau st. Dublin*.—Bog oak carvings, &c.; ornaments in iron pyrites and Galway marble.

779 SAMUELS, S. 29 *Nassau st. Dublin*.—Carvings in bog oak. The production of this class of goods has become of considerable importance as a branch of peculiarly Irish trade, and the manufacture has of late years been characterised by great improvements in the design and finish of the articles.

The bog oak ornaments have an interest derived from the material of which they are mainly composed, and from which they derive their name. Like the extensive coal formations on the other side of the Channel, the bogs of this country furnish us with consecutive pages in the history of the globe, indicating the wonderful changes that have been going forward since the creation of the world. The oak and pine still found in many of the bogs in such an admirable state of preservation bear testimony to the existence there of forests thousands of years ago; and the bog or moss by which these mighty forests have been submerged, how indestructible in itself, and how capable of resisting chemical change!

The hardness as well as the cohesion of the fibres of some of the bog oak is wonderful—qualities which, as well as its jet black colour, fit that substance to become the basis for elaborate ornamentation.

Mr. Samuels, of Nassau street, has maintained for years past a leading position with this class of goods, and his stand in the Exhibition presents a highly interesting collection including pins, bracelets, brooches, necklets, models of ancient castles, and other articles. It has also one article of much interest at the present time—a brooch on which is an admirable representation of St. Patrick's Cathedral. The comic illustrations are also numerous—indicating, amongst others, one of the scenes of Donnybrook Fair, and Paddy and his Pig, in which the pig, proverbial for going the contrary way to that which it is wanted to go, is deceived with a knowing leer by Paddy, who pretends that he is desirous of going the wrong way, and thereby inducing the pig to

go right. The applications of this material are almost endless, and Mr. Samuels shows some of the most appropriate of them.

780 BARRETT, F. 130 *Stephen's green, Dublin*.—Brushes and combs.

781 ELVEKY, J. W. & Co. 46 *Lower Sackville st. Dublin*.—Waterproof garments.

782 GOGGIN, C. 13 *Nassau st. Dublin*.—Carvings in bog oak. In compensation as it were for the coal-fields of England, Ireland possesses vast tracts of peat moss or bogs; in these have been found, deeply buried, the relics of primeval forests which flourished, it may be, before man had trodden the earth. Oak, fir, deal, and yew have been dug up and used for fire-wood and other purposes; but in the present century the hand of Art has converted portions of this product from comparative uselessness to articles of artistic value.

The history of bog-oak manufacture is somewhat interesting. When George IV. visited Ireland in 1821, a person of the name of M'Gurk presented him with an elaborately-carved walking stick of Irish bog-oak, the work of his own hands, and received, we believe, a very ample remuneration. The work was much admired, and M'Gurk obtained several orders from time to time. Subsequently, a man of the name of Connell, who lived in the lovely lake district of Killarney, commenced to do somewhat more regular business in carving the oak to be found plentifully in the district, and selling his work to the visitors as souvenirs of the locality. The trade prospered sufficiently to induce him to establish himself in Dublin some twenty years ago, and at his retirement, the business, now a profitable one, passed to his son-in-law, Mr. Cornelius Goggin, of Nassau street. The beauty of the carving, and the elegance of the designs, chiefly taken from objects of antique Irish art, made these ornaments in fashion, not only in Ireland but in England. The Queen, the Prince Consort, and other members of the royal family and the nobility were purchasers of the most beautiful specimens; and so carving in Irish bog-oak attained the position of a native art, giving employment to many hands and supporting many establishments.

The oak is black and hard as ebony; that best suited for carving is brought from the counties of Meath, Tipperary, Kerry, and Donegal. Of a load, which will be purchased for about thirty shillings, a considerable portion is unfit for use, by reason of flaws or splits. The wood is cut into pieces suitable for carving, and is worked on the end of the grain or section, and not on the length of the grain or plankwise. The process of carving is similar to that of ivory. The more experienced workmen carve designs without any pattern before them, and can earn from forty to fifty shillings a week. The wages of the less expert vary from ten shillings upwards, and women earn nearly as much as men. The total number of persons employed in this artistic handicraft is something over two hundred. Many of them work on the premises of their employers, while others take the material to their own homes.

A method of producing very fine effects at a great saving of cost and labour has been patented by Mr. Joseph Johnson, of Suffolk street. This is effected by stamping: the piece of wood, cut to the required size, is placed on the top of the die, which latter is heated by means of a hot plate of metal upon which it stands; over the wood a similar hot plate is laid; upon this a powerful screw press descends, and the wood receives the impress of the die as freely as wax, the bitumen in it preventing the fibre from cracking or crumbling. In this way objects of exquisite delicacy and very high relief, almost to the height of an inch, are produced in a moment. The designs thus obtained by the die are readily distinguishable from those wrought by the carver's tool; they want the extreme sharpness of the carving, but they are capable of showing, in compensation, more minute figuring and more elaborate details. The dies, some of which are very beautiful in design and all sharply cut, are made on the premises.

This branch of trade has done some service to Art in Ireland, by producing many excellent native carvers, several of them in the humblest walks of life. Amongst those one pre-eminently deserves to be mentioned. Many years ago, three ladies of the name of Grierson, persons of education and refinement, turned their attention to educating some of the young people in their neighbourhood, in the Dublin mountains, in the art of wood-carving, as they had seen it practised in Sweden. The project was successful, and amongst the pupils one of the name of Thomas Rogers attained to such excellence that his work will safely bear comparison with the best artists of any country. He is, of course, in full business. From time to time he comes down from his retired home, a glen in the Dublin mountains known by the poetic name of Glen-na-Smohl, or the "Valley of the Thrush," receives his orders, takes home his wood, and returns in due time with his work executed in the most exquisite manner. Recently he executed for Mr. Johnson, of Suffolk street, one of the most elaborate and beautiful pieces of work that has ever been produced in Ireland—the large bog oak box made for the purpose of holding the Irish lace presented to the Princess of Wales by the ladies of Ireland, the box being a gift to her from the Irish gentry.

It is not easy to estimate the amount of sales of bog

oak work. Mr. Johnson sells between £4,000 and £5,000 a year, and Mr. Samuel M'Connell and others do a proportionately large business. It is to be regretted that a very inferior imitation is produced in England made of common deal, stamped and coloured, which is sold as genuine Irish carved bog oak. It can, however, deceive only the very ignorant or the very unwary.

The stranger who visits Dublin may dispose of an idle hour very agreeably in the inspection of the shops where these bog oak ornaments are sold. The principal establishments are those of Mr. Johnson and Mr. Goggin already alluded to, and of the brother of the latter in Grafton-street, and those of Mr. Samuels in Nassau-street, and Mr. Johnson in Fleet-street. Articles of very much the same character may be seen in them all: antique sculptured crosses in high relief, round towers, abbeys, antique brooches and fibulae, harps, shamrocks, and other national emblems, besides a multitude of articles used in the boudoir and the drawing-room.

Unhappily, there are not many Irish manufactures; it is a duty to encourage those that do exist. They will in time become better as well as more numerous. We have strong faith, not only in the capabilities of the country—so fertile in raw materials of every available and useful kind—but in the power of its people to turn them to valuable account.—*The Art Journal.*

## SECTION XXIX.—MISCELLANEOUS MANUFACTURES AND SMALL WARES.

North Gallery of Nave.

### *Bog Oak Carving and Fancy Goods Manufacture.*

BY E. HARVEY WADGE, F.G.S.

AMONGST the manufactures peculiar to Ireland, perhaps none are more attractive to strangers—excepting lace and tabinets—than that of bog oak and arbutus wood carving. No visitor to the late great International Exhibition in Dublin could have failed to observe the elegance, chaste design, and exquisite workmanship of many of the specimens exhibited by the several artists; we suppose we dare not apply the term "manufacture" to the higher qualities, for some of them are really fine examples of art, and art, too, of no mean order. Still there is room for—and we should like to see in the manufacturing department—a little improvement, of which all must admit this branch of Irish industry is susceptible.

In the higher order of art to which we have referred, several works are admirably executed in detail; a finish is imparted to the coarse and apparently uncongenial raw material it would scarcely be deemed capable of receiving. Some of the pieces illustrative of Irish witticisms are admirably hit off. Who but could admire "Pat and his Pig," "The Tail of my Coat," with many other similar subjects! and who but must applaud the carefully-executed landscape models of the castles, the cathedrals, and round towers of Ireland? They certainly tell well as *souvenirs* of the localities they represent, and are most admirably adapted for that purpose. Doubtless the late Exhibition afforded a rich harvest to the vendors of the articles thus exhibited. We question if any visitor who makes an Irish Summer tour leaves the shores of Erin's Green Isle without making a purchase of a bog oak ornament of some description, either as a personal memento, or for commemorative presents to friends.

Now that Ireland is becoming so much frequented by English, Scotch, French, and other foreign visitors, who, on their return to their respective homes, expatiate, as they must do, on the beauty of Ireland's vales, her picturesque mountains and lakes, the rapidly-rising celebrity of her health-bestowing watering places,

her salubrious climate, and the facilities now afforded for journeys to her famed localities, which merely a few years since were only to be explored by great labour and expense, or learned of by badly executed engravings, worse paintings, or tarry-at-home descriptive books, we assert, now is the time to cultivate and improve this profitable branch of industry.

To persons unacquainted with the vast operations of the English, French, and Scotch makers of articles of fancy and *virtu* in wood, the amount of money expended therein might appear trifling, and beneath treating of in a work of this nature and design. We assure them they are in error, as it forms in the aggregate a vast business, and one of the staple trades of many towns of considerable pretensions.

That erratic and fickle goddess, Fashion, seems for once to have set her patronage and favour on Ireland; it therefore behoves us not to let her slip away again until we have participated in the profits to be realized by her august presence. What the old Cunmock snuff-boxes did for that district, the adaptations of bog oak and arbutus woods may do for Ireland, especially for the city of Dublin. In Scotland, at first, only one or two makers were in the field; the goods they made took the fancy of the public; now there are very large numbers engaged in this favourite and profitable business. Cheapness of the work has been one of the principal causes of this great extension—a fact the Irish artisan will do well to emulate. By perseverance and business habits, these art manufactures—at first intended for mere *souvenirs*—have become as much articles of Scotland's commerce as her Tweed cloths or shawls. The tartan plaid decoration has become almost the distinctive type of the wooden toy trade, as it is technically termed, which has, to a certain degree, superseded and surpassed the once celebrated Tunbridge Wells wooden wares. That, in its day, was a thriving and highly remunerative business, employing many thousands of persons. On its decadence, the artists and tradesmen

engaged in the manufacture, who, from the very nature of their employment, had inculcated a corrected taste for, and a high appreciation of, the beautiful in form, colour, and good workmanship, readily met with engagements, at high wages, in the works of the great London employers amongst congener trades, such as inlaying woods, and as cabinet workers of superior taste and quality. Nothing can surpass the excellence of work displayed in their cabinets and boudoir fittings, as they are practised in their business at Tunbridge.

Now who, after half an hour's study of the articles displayed at bog oak vendors' windows in the streets of Dublin, can for an instant doubt but that the persons who designed and executed such works must be far above the ordinary average of mechanics? Doubtless, there are many of the details of manufacture accomplished by machinery. So much the better; the very gist of our argument, the very pith and marrow of our endeavour is, to so far facilitate the introduction of the goods as to induce Fashion, with her countless myriads of votaries, to adopt the exquisitely beautiful and graceful ornaments offered to their notice.

There can be no doubt on the unbiassed mind that the cultivation of this art must tend to good. It depends in a great degree on the abilities of the persons engaged therein whether or not success attend their efforts. To us the whole case is as palpable as noonday. The grand opportunity is present, and should not by any means be neglected. Even apathy itself should be roused and carelessness chided. The very profit on the sale would be well worthy of notice; but the advantages to be derived, directly and indirectly, are of far greater import, and are far more in accordance with our views. We contend they will cultivate and extend a hitherto comparatively small but important, and highly lucrative business, create and improve taste, and be the means of bringing up a class of industrious skilled artists and mechanical operators so desirable to any country, but more especially in Ireland, and, in all probability, beget artists of the highest order. The influences derived by associating with art, and the stimulus created by competitive exhibition (especially when attended by immensely profitable results), cannot be over estimated; witness what they have done for British art. What have they accomplished for her ceramic and other manufactures. We forbear to quote further; let us be up and doing, and not only endeavour to rival, but to surpass the energies of our neighbours. True, our field and our material are both incapable of such vast development as the instances we have quoted; nevertheless, let us do our best—the best can do no more.

Philanthropists and societies for encouraging the employment of females have here a fine opportunity. In no part of the empire, probably, is there more necessity for such rational and useful, though light, labour than in the cities of Ireland, more especially in Dublin. The chasing and finishing up these works could be confided to, and executed cheaply by, girls, after they had been properly instructed; in fact, it is a species of work admirably adapted and suited to sedentary habits. It may be carried to, and wrought at, their own homes, as in a vast number of other trades in London—wood engraving, for instance—thus obviating the objections so frequently and justly urged against large numbers of females being engaged in one workshop, and is wholly free from taint, either in health or morals. It would afford means of comfortable living to many respectable persons, who, from a variety of circumstances, decline more menial or dependent modes of subsistence.

It is not our purpose to enter into the *modus operandi* of the manufacture, or to describe the various processes by which the splendid products are executed. Were that our aim, we feel assured any of the artists engaged would readily allow us to go over their works, and afford every opportunity for so interesting an illustration. We prefer indeed the end we have in view, which is, to forward their interests, by drawing atten-

tion to their merits, and to encourage an art containing, as we contend it does, so many elements of good.

We conceive that were larger works than any we have yet had an opportunity of seeing, to be executed and brought into the market they would meet with a ready sale. The infinity of adaptations to jewellery and *souvenir* purposes seems to have reached the verge of excellence and variety; still, fashion is so fickle, that our artists must be on the alert to be, if not in the van, as near it as possible; by no means to be in the rear. Whilst treating on this portion of our subject, we may be excused by the makers if we mention a fault, and a decided objection to many of their works, which we have heard from many of our fair friends—viz., the careless setting of the so-called (*quasi*) Irish diamonds. The frequency of their falling out of their settings is a matter of common complaint. The same may be said of the pins and fastenings of brooches, armlets, and similar ornaments. We suggest and believe these obvious defects can be easily remedied and avoided; still the articles would not cost more than at present. The manufacturers should bear in mind that the excellence of their goods, especially in articles of these classes, is their highest recommendation. We would also advise the vendors to have on their address cards of business, and on their wrapping papers, a short word of advice printed, teaching how the articles should be cleansed and restored when sullied by dust (to which they are peculiarly liable) or tarnished by exposure. We would also hint to them the policy of obtaining for their superior goods some *bona fide* real Irish stones. Amethyst, of considerable size, good colour, and susceptible of a brilliant lustre, can be easily and cheaply obtained from Achill Island, county Mayo. There are, in many places, quartz that will bear a good polish, and are very transparent; serpentine, equal to blood-stone in colour, also the finer specimens of Connemara and Oughterard marbles may be rendered elegant adjuncts.

We opine certain sizes of pictures and looking-glass frames, clock and watch stands, candelabra, &c., elaborately wrought, and of good designs, would meet a rapid sale. We should like to see some large and important pieces executed in the most florid style the material is capable of being carved into. We feel sure they would find places in mansions that are the abodes of wealth, luxury, and taste, where trivial mementoes would scarcely be admitted. We are persuaded that this branch of Irish industry is capable of great extension, and trust our faint endeavours may be a help to its realization.

783 M'CORMICK, H. 5 Castle Buildings, Belfast.—Bog oak jewellery.

784 TRAUB, T. 8, 53 Gracechurch st. London, E.C.—Elastic pipe joints, &c.

785 CONNELL, D. 38 Wicklow st. Dublin.—Bog oak ornaments.—(Agricultural Hall, Kildare st.)

786 GOGGIN, J. Grafton st. Dublin.—Bog oak carvings, ornaments, &c.

787 HEATLEY, J. 112 Middle Abbey st.—Bog oak carvings.—(Agricultural Hall.)

788 RENAN, W. 2 Lower Pembroke st.—Gothic carved oratory; antique chimney-piece.—(Agricultural Hall.)

790 SMITH, W. & A. Mauchline, Ayrshire, and 61 Charlotte st. Birmingham.—Scotch tartan wood work.

791 FERGOUSON & Co. 105 Grafton st. Dublin.—India rubber articles.

792 HOGAN, Miss M. 11 Winetavern st. Dublin.—Wax flowers.

793 MOORE, J. 3 South Cumberland place, Dublin.—Models of Irish ruins; table ornaments, &c.—(Agricultural Hall, Kildare st.)

795 NATHAN, E. 56 Great Strand st. Dublin.—Billiard markers; cues; trunks and portmanteaus.—(Agricultural Hall, Kildare st.)

796 DODGE, G. P. 79 Upper Thames st. and Bromley Rubber Works, London.—Vulcanized India-rubber valves; washers; steam packings, &c.



809 LAWRENCE & SON, 7 *Upper Sackville st. Dublin*.—Toys, Rocking horses, and perambulator.

810 PALSER & MANSFIELD, 39 *Oakley st. Lambeth, London*.—Rocking horses, with guard to rocker; model of horse carved in wood.

811 SOUTHERN, E. *Broseley, Shropshire*.—Patent Brosely glazed tobacco pipes, and Narghilé; pipes of various kinds.

812 WATTERS, T. *John's lane Racket Court, Dublin*.—Rackets and racket balls; shoes, presses, &c.

813 BELOE, W. L. *Home place, Coldstream*.—Fishing rods, tackle, &c.

814 WEEKES & SON, *Essex quay Dublin*.—Fishing rods, tackle, &c.

815 ST. MART'S BLIND ASYLUM, *Portobello Dublin*.—Basket and worsted work.—(*South Gallery of Nave*.)

816 MOLYNEUX ASYLUM FOR THE BLIND, *Upper Leeson st. Dublin*.—Basket and worsted work.—(*South Gallery of Nave*.) See illustration p. 306.

According to the last census it appears that there are

about 7,000 blind of both sexes in Ireland, the females exceeding 3,600. There is no country in Europe, except Norway, in which the blind bear so large a proportion to the whole population.

Whilst considerably more than half of these blind persons are more or less destitute, there are not more than 1,000 in the poorhouses, and in all the asylums only 360, of both sexes.

From this it will appear that very little has hitherto been done to meet the exigencies of the case; and it may be said of the asylums already established, that few of them are well adapted to the peculiar requirements of the blind.

God has to a great extent compensated the blind for the loss of the faculty of sight, by quickening the faculties of hearing and touch; and it has been proved, that with proper training and the due development of the feeling of self-dependence, they are capable of earning an honest livelihood, and of becoming blessings to society.

## CLASS E.—MISCELLANEOUS MANUFACTURES.

### JURY.

ISIDORE CORBIÈRE, Merchant,	-	London.
BARON DI DONNAPUGATA, Roy. Italian Commissioner,	-	Italy.
ALPHONSE GAGES, Curator of the Museum of Irish Industry,	-	Dublin.
PETER GRAHAM, Upholsterer,	-	London.
A. G. JONES, Architect,	-	Dublin.
J. A. KEATING, Sec. to the Leinster Archery Club,	-	Dublin.
J. J. MACARTHY, R.H.A., Architect,	-	Dublin.
LOUIS PETRE, Merchant,	-	Belgium.
W. E. STEELE, M.D., Ass. Sec. to the Royal Dublin Society,	-	Dublin.
W. K. SULLIVAN, Ph. D., Prof. of Chemistry, Museum of Irish Industry,	-	Dublin.
ALEXANDER VON SYBEL, Commissioner for Prussia,	-	Zollverein.

### SECTION XXVI.

DECORATION, FURNITURE, AND UPHOLSTERY, INCLUDING PAPER HANGINGS, PAPIER MACHÉ, AND JAPANNED GOODS.

NOTE.—The firm of JACKSON & GRAHAM, 29, *Oxford st. London, W.*—(*United Kingdom*, 732) exhibit mural decoration and cabinet furniture, but, in consequence of Mr. Peter Graham being a member of the Jury, are precluded from receiving an award.

### LIST OF AWARDS.

#### MEDAL.

#### UNITED KINGDOM.

713 BETTRIDGE, J. & Co. *Birmingham*.—Papier maché and japanned tea trays; tables, chairs, writing desks, ink stands, tea caddies, photograph albums, &c.

714 DYER, & WATTS, 1 *Northampton st. Lower road, Islington, London, N.*—Lady's wardrobe of pine, stained by Dyer's patent process (registered); ladies' toilet tables, and small tables in patent pine.

716 GILLOW & Co. 176 *Orford st. London, W.*—Walnut side board, carved and inlaid with marbles; carved walnut cabinet; cabinet inlaid marqueterie and mounted ormolu; richly inlaid console cabinet; carpets and silks; drawing and dining room chairs, &c.

718 HOWARD & SONS, 26 & 27 *Berners st. Oxford st. London, W.*—Furniture in the style of Louis XVI.; duchess writing table; princess table; chalet chairs, carved and gilt; easy chairs, &c.

724 STRAHAN, R. & Co. 24 *Henry st. and 5 Leinster st. Dublin*.—Cabinet in Italian style; console table in the style of Louis XV.

726 TROLLOPE, G. & SONS, *Halkin st. West, Belgrave sq. London, S.W.*—Ebony cabinet.

727 TUDSBURY, R. & SONS, *Edwinstowe, near Ollerton, Nottinghamshire*.—Carvings, from nature, in limewood; carved brackets and tables in brown oak.

728 WOOLLAM, W. & Co. 110 *High st. near Manchester sq. London, W.*—Medieval and other paper hangings.

730 ANNOOT, C. 16 *Old Bond st. London, W.*—Buhl cabinet in the style of Louis XIV.; bronze and ormolu candelabra; tables and other fancy furniture.

734 BRUNSWICK BROTHERS, 72 *Newman st. Oxford st. London, W.*—Amboyne cabinet, style of Louis XVI.; pair of Bonheur de jour, in satin-wood, in the style of Louis XVI.; portefeuille bureau; chairs; flower stands.

735 FRY, W. & Co. *Bachelors' walk, Dublin*.—Carved and gilt Gothic furniture and interior decorations; gilt bronze lamps and stands, &c.

736 HEYWOOD, HIGGINBOTTOM, SMITH, & Co. (LIMITED).—15 *Parliament st. Dublin*.—Paper-hangings.

739 WHYTECK, R. & Co. 9 and 11 *George st. Edinburgh*.—Engraved and illuminated ash bed-room furniture.

742 CRACE, J. G. 14 *Wigmore st. London, W.*—Furniture and decoration.

753 SKIDMORE'S CONSTRUCTIVE IRON CO. *Alma st. Coventry*.—Church plate; gas standards; panel of wrought iron screen.

754 HART, J. & SON, *Wych st. and Cockspur st. London, W.C.*—Medieval metal work; monumental brasses; candelabra; flower vases; lecterns; patent lightning conductors; patent spring door centres, and ventilators.

755 COX & SON, 28 *Southampton st. Strand, London, W.C.*—Oak retables, carved by machinery; carved oak altar table; carved oak eagle lectern; polished brass corona; wrought iron altar rail standards; church carpets, hangings, &c.

#### AUSTRIA.

50 KERN, C. G. 8 *Salenianergasse, Vienna*.—For imitations of arms, trophies, and other ornaments in carton pierre.

50A KITSCHEL, HEIRS OF, *Vienna*.—For cast-iron furniture, covered with velvet.

53 SCHOENTHALER, F. *Sofienegasse, Vienna*.—For furniture of carved wood.

55 THONET, BROS. 1 *Donaustrasse, Vienna*.—For furniture of bent wood.

**BELGIUM.**

- 158 HENRAED, H. *Spa*.—For albums from Spa.  
160 LUPPENS, H. *Brussels*.—For time pieces and vases of marble and bronze.

**FRANCE.**

- 106 LEGLAS-MAURICE, *Nantes*.—For general merit in carved furniture.  
102 FOURDINOIS & SON, *Paris*.—For great excellence in fancy furniture.

**ITALY.**

- 459 BAZZANTI, PIETRO & SON, *Florence*.—For mosaic *Pietre dure* table.—Distinguished merit.  
461 CANTIERI, FRANCESCO, & VIRGILIO, *Lucca*.—For lady's work table, inlaid with mother-o'-pearl, ivory, and metal.  
463 FONTANA, DOMENICO, 9 *Borgo di Porto Venezia, Milan*.—For ebony cabinet inlaid with ivory, with a copy of the Dance of Cupids, painted by Albani.  
464 FRULLINI, LUIGI, *Florence*.—For carved walnut wood chest, ornamented with infants and group representing a bear hunt, cinque cento style; two ornamental gilt consoles, modern style.  
465 GAJANO, EGISTO, *Florence*.—For sculptured walnut wood frame, Florentine cinque cento style.  
467 GATTI, GIOVANNI BATTISTA, *Rome*.—For high excellence of design and execution in inlaid furniture.  
468 LANCETTI, FEDERICO, *Perugia*.—For excellence of design and finish in his ebony table top inlaid with various woods, mother-o'-pearl, ivory, and metal, in the style of the 15th century.  
469 LEVERA BROS. *Turin*.—For carved walnut wood furniture and chandelier.  
471 MONTENERI, ALESSANDRO, *Perugia (Umbria)*.—For excellence of execution in his twelve pieces representing the principal monuments of Italy.  
474 SEVESO, VINCENZO, 29 *via S. Pietro all'Orto, Milan*.—For ebony table inlaid with ivory; ebony cabinet; box of Indian and other woods, richly carved and inlaid.  
477 TORRINI, GIACONDA & Co. *Florence*.—For Florentine mosaic table; collection of mosaics and ornamental objects.

**NETHERLANDS.**

- 63 NOOYEN, L. J. *Rotterdam*.—For japanned goods, enamelled and incrustated with mother-o'-pearl, illuminated with fine views.  
54 ZIEGERS & ZOON, WED. J. P. *Amsterdam*.—For japanned goods, enamelled.

**ZOLLVEREIN.**

- 85 HIERONIMUS, W. *Cologne, R. P.*—Gilt mouldings and cornices—for useful and cheap fabric.  
87 ERNER, J. *Cologne, R. P.*—For oaken cabinet, richly carved in Medieval style.  
88 RAMPENDHAL, H. C. 13 *Alster Arcade, Hamburg*.—For furniture in skin and horns of animals of the chase.  
90 DOBBELMANN, J. *Deutz, near Cologne, R. P.*—Gilt mouldings and cornices—for useful and cheap fabric.  
130 MAYER & Co. *Artistic Establishment, Munich*.—For great excellence in his statue of artificial stone, his richly gilded altar, carved in oak wood, and his Adoration of the Three Kings.

**HONOURABLE MENTION.****UNITED KINGDOM.**

- 712 BEAKEY, P. 39 *Stafford st. Dublin*.—For Gothic oak sideboard; oak library chairs, &c.  
715 EGAN, J. 10 *Main st. Killarney*.—For cabinet and fancy furniture in arbutus wood, inlaid.

- 721 M'DOWELL, H. 52 *Mary st. Dublin*.—For gilt pier table; walnut and mahogany furniture.  
722 SEDLEY, A. & Co. *Burlington Furniture Galleries, 38 Conduit st. W. London*.—For collection of chairs.  
725 TAYLOR, J. & SON, 109 *Prince's st. Edinburgh*.—For sideboard in pollard oak.  
731 DEAREN, T. F. 13 *Soho sq. London, W.*—For console table.  
737 PURDIE, BONNAE, & CAEPRAE, 77 *George st. Edinburgh*.—For wall decoration, in the Italian style.  
740 BYRNE, J. J. & SONS, 6 *Henry st. Dublin*.—For furniture.  
741 BOYLE, R. B. JUN, *Marlborough st. Dublin*.—For wood carvings.  
719 ROSS & Co., 8 *Ellis's quay, Dublin*.—For camp furniture.

**CANADA.**

- 60 HEISE, C. *Preston*.—For waved mouldings.  
61 JACQUES & HAY, *Toronto*.—For specimens of wood in his mosaic table.

**AUSTRIA.**

- 49 STUMMER, A. 21 *Hungelbrunnngasse, Vienna*.—For wooden fans.  
51 PODANT, F. & M. 32 *Westbahnstrasse, Vienna*.—For mosaic veneers for fancy cabinet work.  
52 RAINER, M. VON, 15 *Schleifmühlgasse, Vienna*.—For articles of carton-pierre and staghorn.  
54 SIEBURGER, R. & B. *Prague, Bohemia*.—For paper hangings for counters, railway stations, &c., representing a railway map.

**BELGIUM.**

- 157 DILLEN, J. *Brussels*.—For marble furniture.  
159 HERMAN, J. *Liege*.—For art designs.  
163 REIGLER-DELEAU, *Spa*.—For articles from Spa.

**FRANCE.**

- 103 DIKHL, *Paris*.—For fancy furniture.  
106 GERSON & WEBBER, *Paris*.—For fancy furniture, and wood carving.

**ITALY.**

- 460 CALVI ANTONIO, 39 *Corso Vittorio Emanuela, Milan*.—For carved wood and ornamented composition frames.  
466 GARGIULO, ALMERICO, *Sorrento, (Naples)*.—For inlaid mosaic tables in wood.  
470 LURASCHI, ANTONIO, 4 *Borgo di Porta Romana, Milan*.—For slate billiard table in ebony.  
473 ROVELLI, CARLO, 29 *Via del Monte Napoleone, Milan*.—For wooden blinds.  
475 STIKLER, BARTOLOMEO, 432 *Strada Toledo, Naples*.—For morocco writing and dressing cases, case of petrified wood, &c.  
476 TOMAGNINI BROS. *Pietrasanta (Lucca)*.—For marble tables.

**NETHERLANDS.**

- 57 DRILLING, A. *Amsterdam*.—For ladies' work table.

**ZOLLVEREIN.**

- 86 STOLLWERK BROS. *Cologne, R. P.*—For mechanical desks.  
89 EUL, N. J's SON. —For cornices, mouldings, and ornaments of papier maché.  
129 TRIMBORN, C. *Munich*.—For animals copied from nature, in papier maché.  
HEGMANN, SCHMIDT & Co. *Mannheim*.—For mirrors.

## SECTION XXVII.

MANUFACTURES IN MINERAL SUBSTANCES, USED FOR BUILDING OR DECORATION.

## LIST OF AWARDS.

## MEDAL.

## UNITED KINGDOM.

762 HISSON, R. 85 Talbot st. Dublin.—For elaborate design and beauty of material.

765 MAW & Co. Benthill Works, Broseley.—For variety and excellence in the style of ornament of their encaustic tiles.

766 SHEPPARD, S. 23 Lower Ormond quay, Dublin.—For excellence of workmanship and material.

768 MAGNUS, G. E. 39 Upper Belgrave place, Pimlico, S.W.—For a collection of chimney pieces in enamelled slate, in the Florentine style, remarkable for design and merit of execution.

## BELGIUM.

70 BEERNAERT, A. Auderghem, near Brussels.—For two marble chimney pieces, combining cheapness with beauty of material.

72 LECLERCQ, A. J. Brussels.—For chimney-pieces, combining excellence of design and merit of execution.

## FRANCE.

104 CHAMPIGNELLE, Metz.—For a statue of the Virgin and Child in terra cotta, decorated in polychrome, being an excellent illustration of that special kind of decorative art.

107 VILLEMER, Paris.—For garniture of clocks in alabaster and Olynx marble, combining elegance with beauty of material.

## ZOLLVEREIN.

93 SADER & POENSCEN, Düsseldorf.—For hydraulic cement of an excellent quality.

131 THORSCHMIDT, C. L. & Co. Pirna-on-the-Elbe.—For fine specimens of porous earthenware.

## HONOURABLE MENTION.

## UNITED KINGDOM.

763 M'CULLOUGH, D. Marble and Stone Works, Armagh.—For a well-executed chimney-piece in Armagh marble.

764 M'DONALD, FIELD, & Co. Granite Works, Aberdeen.—For various specimens of manufactured Aberdeen granite.

## VICTORIA.

13 CORNWELL, A. Brunswick.—For his collection of glazed earthenware.

16 GLEW, J. Brunswick.—For ornamental bricks and clay.

26 MARKS, G. Crewick road, Ballarat.—For a collection of drain pipes and pottery.

## ROME.

35 DURI, BALDASSARE & Co.—For good specimens scagliola tiles.

## ZOLLVEREIN.

91 BROESSEL, F. Neustadt, near Magdeburg.—For a special kind of roofing felt, combined with hydraulic cement.

92 CARSTANJEN, JULIUS, Duisburg, R.P.—For felt combined with asphalt cement.

## SECTIONS XXVIII. &amp; XXX.

MANUFACTURES FROM ANIMAL AND VEGETABLE SUBSTANCES NOT BEING WOVEN OR FELTED, OR INCLUDED IN OTHER SECTIONS; MISCELLANEOUS MANUFACTURES AND SMALL WARES.

## LIST OF AWARDS.

## MEDAL.

## UNITED KINGDOM.

774 GONNE, Mrs. 26 Clare st. Dublin.—For taste and execution of illumination in different styles of eight beatitudes, and for collection of wax flowers.

775 HEINRICH, J. 36 Lower Kennington lane, London, S.—For excellence of manufacture of tortoise-shell combs.

776 HOPKINS, Mrs. J. 39 Great Brunswick st. Dublin.—For general excellence of whole collection of illuminations and paper flowers.

777 INDIA RUBBER, GUTTA PERCHA, AND TELEGRAPH WORKS CO. (LIMITED), Silvertown, Essex; Persan-Beaumont and St. Denis, France; and Menin, Belgium.—For manufacture and applications of ebonite, and general excellence and variety of whole collection.

783 M'CORMICK, H. 5 Castle Buildings, Belfast.—For taste in design and execution of bog oak jewellery.

785 CONNELL, D. 38 Wicklow st. Dublin.—For cutting and polishing of quartz jewels for bog oak ornaments.

786 GOGGIN, J. Grafton st. Dublin.—For design and execution of bog oak articles, especially a flower vase.

790 SMITH, W. & A. Mauchlin, Ayrshire, and 61 Charlotte st. Birmingham.—For a good collection of Scotch tartan and other ornamental wood work.

792 HOGAN, Miss M. 11 Winetavern st. Dublin.—For beauty and fidelity to nature of wax flowers.

793 MOORE, J. 3 South Cumberland place, Dublin.—For design and workmanship in bog oak jewellery.

801 ALDRED, T. 126 Orford st. London, W.—For bows and other archery equipments, and fishing tackle.

804 FLINT, J. 17 Essex-quay, Dublin.—For good fishing rods and flies.

806 GERRARD, E. jun. 31 College place, Camden town, N.W.—For a beautifully prepared and well mounted collection of skeletons of animals.

807 JEFFERIES & MALINGS, Wood st. Woolwich, Kent.—For excellence of rackets and racket balls.

809 LAWRENCE & SON, 7 Upper Sackville st. Dublin.—For well made perambulator and rocking horse.

812 WATTERS, T. John's lane, Racket Court, Dublin.—For superior rackets of unsteamed wood, and good quality of racket balls.

813 BELOS, W. L. Home place, Coldstream.—For very superior fishing rods and flies.

## CANADA.

37 BOYD, J. Montreal.—For excellence of manufacture of toilet and horse brushes.

63 SELIVERY & Co. Toronto.—For ingenuity of their patent boot-trees.

77 TAHOURHENSHE (Huron chief) Lorette, C.E.—For a beautiful collection of fancy Indian wood-work.

## NOVA SCOTIA.

17 THOMAS, MARY, (Indian squaw).—For a collection of fancy articles of Indian workmanship.

23 DOWNS, A.—For excellence in stuffing and mounting a collection of the native birds of Canada.

## VICTORIA.

102 ARNOLD, C. Melbourne.—For a collection of well made pipes of the wood of the *Acacia homalophylla*, or sweet scented myall wood.

118 ROBERTSON, J. Melbourne.—For very well dyed emu feathers.

**AUSTRIA.**

16 SCHUBERTH, J. *Vienna*.—For his split-wood blinds, suitable for warm climates, and for his porcelain headed nails, adapted for ornamental work.

44 JABUREK, F. 41 *Gumpendorfergasse, Vienna*.—For real meerschauum pipes.

47 TREBITSCH, A. 7 *Hundsthurnerstrasse, Vienna*.—For a very large and varied collection of pipes of natural and artificial meerschauum.

57 PAGET, E. A. 15 *Riemergasse, Vienna*.—For good quality, combined with cheapness, of cavalry overalls and other waterproof goods.

**BELGIUM.**

165 VAN KERBERGHE, *Malines*.—For archery equipments of moderate price.

**CHINA.**

1 HEWETT, W. & Co. 18 and 19 *Fenchurch st. London, E.C. and Hong Kong*.—For a very beautiful carved ivory cup, and collection generally.

**FRANCE.**

108 FAUVELLE-DELEBARRE & SON, *Paris*.—For excellence of manufacture of tortoise shell and ebonite, or hardened India-rubber combs.

109 ROURA, A. *Marseilles*.—For beautifully coloured wax candles.

**ZOLLVEREIN.**

94 FRETWELL, J. *Lippstadt, Prussia, and Mark lane, London*.—For jewellery made from Meyer's melanite, or hardened India-rubber.

96 MEYER, H. C. JUN., *Hamburg*.—For excellence of manufacture of hardened India-rubber, adapted to carving, &c., and its application for toilet-brush handles; split rattan, whalebone, and large variety of canes.

**HONOURABLE MENTION.****UNITED KINGDOM.**

191 THE LONDON INDIA-RUBBER CO. 20 *Cannon st. London, E.C.*—For India-rubber carpets and collection generally.

779 SAMUELS, S. 29 *Nassau st. Dublin*.—For general collection of bog oak work.

796 DODGE, G. P. 79 *Upper Thames st. and Bermondsey Rubber Works, London*.—For vulcanized India-rubber steam packings, washers, and valves of good quality.

808 LAWRENCE, J. 39 *Grafton st. Dublin*.—For collection of cricketing and archery equipments, rackets, &c.

814 WEEKES & SON, *Essex-quay, Dublin*.—For fishing rods and flies.

**BAHAMAS.**

2 ROBERTSON, Mrs. S.—For shell-work basket.

**CANADA.**

35 GREEN, A. *Hamilton*.—For serviceable quality of brushes.

36 BOREKH, C. *Toronto*.—For good quality of brushes.

51 MARTIN, Mrs. J. *Stanstead, C.E.*—For embroidered shawls.

64 LOW & WILSON, *Sherbrooke, C.E.*—For window sash and Venetian shutters; simplicity and cheapness.

64 FLETCHER, C. H. *Sherbrooke, C.E.*—For good confectionery.

65 REED, G. W. *Montreal*.—For an ingenious last for cleaning boots.

**NOVA SCOTIA.**

47 MACDOUGALL, Miss.—For painted fancy work.

**VICTORIA.**

100 TIMBRELL, A.—For sheepskin ornamental work.

124 LETHBY, Mrs. *Footscray*.—For good ornamental leather work.

**AUSTRIA.**

48 GOLDMANN, M. 3, *Webgasse, Vienna*.—For cheap imitation of meerschauum.

61 SCHEIDLER & GRIESHEIM, *Laihack, Carniola*.—For excellence and cheapness of wood prepared by machinery for making lucifer matches.

**ITALY.**

480 AMBROGIO, GIUSEPPE, *Brescia*.—For landscape in cork.

481 CAPASSO, PROF. GENNARO, 33 *via Maddalena ai Tribunali, Naples*.—For straw mosaic work.

**JAPAN.**

1 ALCOCK, SIR RUTHERFORD, K.C.B. *London*.—For collection.

2 DUGAN, C. W. *St. John's, Enniscorthy, co. Wexford*.—For collection.

**NETHERLANDS.**

59 KACKS, H. T. *Amsterdam*.—For pictures cut in cork.

**SWEDEN AND NORWAY.**

6 MANILLA INSTITUTE FOR THE BLIND, DEAF, & DUMB, *Stockholm*.—For apparatus for calculating intended for the use of the blind.

**ZOLLVEREIN.**

95 HERBST, A. *Bonn, R.P.*—For a wicker chair of excellent workmanship.

# COLONIAL DEPARTMENT.

## COLONIAL COMMITTEES.

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 Rev. Dr. ADAMSON, Chaplain, Legislative Council  
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 R. BROUGH SMYTH, Esq.  
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 CANADA, - Hon. THOMAS D'ARCY M'GEE  
 Rev. W. AGAR ADAMSON, D.C.L.  
 THOMAS DEVINE, Esq., F.R.G.S.  
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 CANADA EAST, WILLIAM JOURNEAU, Esq.

INDIA, - - - Dr. J. FORBES WATSON  
 Col. MEADOWS TAYLOR  
 MAURITIUS, - - J. MORRIS, Esq.  
 NOVA SCOTIA, - - Rev. Dr. HONEYMAN  
 SIERRA LEONE, - - Brig.-General O'CONNOR  
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 Colonel MEADOWS TAYLOR  
 Director—Dr. J. FORBES WATSON, India Museum,  
 Whitehall-yard, London  
 CALCUTTA.  
 Temple Wilcocks, Esq.

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 Sec.

## *Report on Colonial Exhibits at the Several Exhibitions.*

By P. L. SIMMONDS.

AT the first Exhibition, in 1851, the Colonies were, as a whole, almost unrepresented. The notice given them was too short; the undertaking was hurried; the project was quite new; and moreover, most of the Colonies were scarcely then in a position to go to much expense for contributions. The East India Company, however, made a noble display, and some few of the British Colonies a respectable appearance in 1851, and also at Paris in 1855.

It appears from the official reports, that out of 23,575 superficial feet of horizontal net space allotted to the British Colonies in 1851, but 1,180 feet were occupied. The only Colonies then specially represented were Canada, which made a good display; a few objects were indirectly sent for exhibition from Nova Scotia, New Brunswick, Newfoundland, and Bermuda. From the West Indies a small collection was sent from the Bahamas, and a few miscellaneous articles from Antigua and Barbadoes; Trinidad and British Guiana were well represented. Of the African Colonies, the Cape Colony was the only one that sent a collection; a few objects illustrating the products of St. Helena and the west coast of Africa were shown by London merchants and individual exhibitors in England. Of the Eastern Colonies the Mauritius sent but little; a fair collection was, however, transmitted from Ceylon.

The Australasian Colonies were but poorly represented, although a few made some efforts to put in an appearance. The New South Wales and Tasmanian collections were creditable, and a few things were sent from South Australia and New Zealand. With the exception of a small collection from Malta, this formed the aggregate of the colonial efforts in 1851.

At the Paris International Exhibition in 1855, the few Colonies that did send articles made a very satisfactory display. Canada, especially, obtained honour for its varied collections, which occupied upwards of 3,000 feet of space, contributed by about 350 exhibitors. Jamaica covered an area of about 500 feet, and British Guiana 350; whilst Barbadoes and the Bahamas were the only other West India Colonies that exhibited. Ceylon occupied nearly as much space as Demarara, and the Mauritius sent a small collection. The Australasian Colonies on that occasion were very well represented, although one or two did not show: 250 exhibitors from New South Wales occupied 871 square feet; 118 exhibitors from Tasmania 429 feet; 36 from Victoria 289 feet; and 10 from Newfoundland 117 feet. The 12 British Colonies which exhibited at Paris filled about 500 feet more space than all the colonies which were represented in 1851. At the second London Exhibition in 1862, the space allotted to the Colonies was 12,822 superficial feet, apportioned as follows:—300 to the East India Colonies; 4,550 to the Australian group; 640 to the South African Colonies; 200 to the West African Colonies; 400 to the Mediterranean (including the Ionian Islands, no longer under the British crown); 5,895 to the North American Colonies; and 837 to the West Indies.

The following return shows the colonies and outlying dependencies which exhibited in 1862, arranged alphabetically, with a rough estimate of their exhibitors:—

Colonies	Approximate Number of Exhibitors	Colonies	Approximate Number of Exhibitors
Bahamas, - - -	5	New Brunswick, - -	36
Barbadoes, - - -	Commission.	Newfoundland, - -	22
Bermuda, - - -	"	New South Wales, - -	335
British Columbia, - -	"	New Zealand, - -	114
British Guiana, - -	"	Nova Scotia, - -	65
Channel Islands, - -	5	Prince Edward's Island, -	Commission.
Canada, - - -	Commission.	Queensland, - -	98
Cape of Good Hope, -	"	South Australia, - -	77
Ceylon, - - -	41	St. Helena, - -	Commission.
Dominica, - - -	Commission.	St. Vincent, - -	4
Hong Kong, - - -	Commission; in cluded in China.	Tasmania, - - -	650
Jamaica, - - -	195	Trinidad, - - -	1
Malta, - - -	Commission.	Vancouver, - - -	6
Mauritius, - - -	22	Victoria, - - -	Commission.
Natal, - - -	Commission.	Western Australia, -	69
		Total,	1,745

Most of the industrial divisions were well filled by nearly all the colonies exhibiting; and the collection of raw produce was particularly rich and interesting.

The eastern colonies began with Hong Kong, which showed a small but interesting collection of Chinese produce and manufactures, and took under its wing a number of British merchants, officers, and some exhibitors, who showed choice and very attractive specimens of Chinese industry, and silk, rich velvets, silk and gold embroidered carpets, porcelain, china, enamels, and articles of raw produce.

Ceylon forwarded a very large and interesting collection of colonial products—coffee and cinnamon, woods and fibres, pearls, &c. Mauritius sent beautiful specimens of sugar, fruits and vegetable substances.

The Australian colonies exhibited one of the most extensive and finest collections of the whole group, and on the collecting, arranging, and despatching of these a very large amount of money was expended.

New South Wales had a beautifully arranged collection of its gold products from all the principal fields, in the several shapes of nuggets, quartz, grain gold, washing stuff, coin from the Sydney mint, &c. It sent an excellent assortment of Australian wines, the best of its wools and fleeces, and cloth made from them; stuffed alpacas, and the shorn fleeces of the flocks now in the colony; coal, minerals, native woods, and various agricultural produce and manufactures.

Queensland, which appeared for the first time in Europe, came forward most creditably, with its ornamental and useful woods, wool, cotton, and tropical products.

South Australia was principally strong in its rich mineral products, of copper and lead, and malachite manufactures, and its wheat and flour, for which it has always been noted.

Western Australia also sent specimens of woods, in which it is especially rich, some of the spars and planks being very fine. Its other products assimilate to those already mentioned.

Victoria went to great expense to forward an enormous collection; the only difficulty was to find room for half the goods sent. One of the most striking objects was a gilded obelisk representing the actual amount of the gold found in the colony since 1851—about eight hundred tons, or one hundred and three millions sterling. Its manufactures and general industry were well represented, and a more extensive and varied collection was never before sent from any British colony to Europe.

Tasmania sent, besides its wool, manufactures, and agricultural produce, a noble trophy, rising ninety or one hundred feet, made of its native woods, with a circular staircase in the interior. Two whale boats, with all their gear were slung from it, and a fine native spar, surmounted with a flag, rose from the centre.

New Zealand sent, from several of its provinces, wool, woods, coal, gold, and agricultural produce.

The African settlements which exhibited were—Natal, which, though a comparatively young colony, took great pains to get together a fitting representation of its indigenous wealth and native industry. Tropical industry, agriculture, and the products of the chase were chiefly represented; and a large counter, or carved sideboard, of native wood, with glazed panels, covering charts, photographs, and water-colour drawings of natives and scenery, formed a striking object. The Cape Colony was unrepresented, except by a few individual exhibitors. St. Helena and one or two of the other West African settlements sent small contributions.

The Mediterranean possessions which exhibited were Malta and the Ionian Islands. The former showed stone, lace, silver work, and other products of industry, with some agricultural specimens. The Ionian Islands had a fine collection, not only of agricultural but of manufacturing industry, sent by about one hundred and seventy exhibitors. The embroidery and silver filagree work, the silks, and other articles, were very elegant.

The North American colonies generally sent a large collection, and were well represented. Canada was rather tardy; but the Lower Provinces took great pains to send such collections as might give a fair idea of their chief products. Timber, minerals, the products of the fisheries, agricultural and other implements, hardware, and homespun, formed their main products.

The West Indian possessions exhibited, if not much variety, still many interesting articles. Their staples of coffee, sugar, rum, arrowroot, and cocoa, possessed, it is true, little novelty; but their woods and fibres were valuable, and their gums, oils, drugs, and other raw materials, were examined with interest by many manufacturers.

At the Dublin Exhibition in 1865 there was little opportunity afforded for the Colonies to do justice to their resources. Mr. Simmonds scarcely had six month's time to communicate with the Colonies. Besides this short notice the space available was very limited, and few of the Colonial Legislatures were sitting, so that it was found impossible in many instances to obtain grants of money for the necessary expenses. But taking these difficulties into account there was a very fair colonial representation.

The Secretary of State and Under Secretary of State for the Colonies kindly aided the Executive Committee in every way, as the following letters will show :—

Downing-street, 11th July, 1864.

Sir,

I have laid before Mr. Secretary Cardwell your letter of the 18th ultimo, and I am directed to acquaint you in reply that Mr. Cardwell will address a Circular Despatch to the governors of the different colonies, calling their attention to the object of the Dublin Exhibition Palace and Winter Garden Company, and will request them to afford such assistance and encouragement to the undertaking as it may be in their power to render.

I am to request that you will furnish one hundred copies of the printed notices which accompanied your letter for transmission to the various colonies.

I am, Sir, your obedient Servant,

C. FORTESCUE.

Henry Parkinson, Esq.

Downing-street, 30th January, 1865.

Sir,

In answer to your letter of the 11th instant, I am directed by Mr. Secretary Cardwell to acquaint you that he has addressed a further Despatch to the several governors of the colonies specified in your letter, forwarding the abstract which you have furnished of what is likely to be done by the colonies for the Dublin Exhibition, and repeating the hope already expressed, that the colonies now referred to may be able, by early action, to further the objects of the enterprise.

I am, Sir, your obedient Servant,

FREDERIC ROGERS.

P. L. Simmonds, Esq.,  
John-street, Adelphi, W.C.

Downing-street, 22nd February, 1865.

Sir,

With reference to your letter of the 18th June last, I have the pleasure to send you, by the desire of Mr. Secretary Cardwell, for the information of the Executive Committee of the Dublin International Exhibition, the copy of a despatch from the Governor of Mauritius, with its enclosures, reporting a Vote of the Legislative Council for two hundred and fifty pounds for defraying the expense of sending contributions to the Exhibition.

I am, Sir, your obedient Servant,

(Sig.)

FREDERIC ROGERS.

H. Parkinson, Esq.

The gross floor space allotted to the colonies in the galleries was 3,624 superficial feet, and to India 2,896 feet, which was all fully occupied.

At the Dublin Exhibition, in 1853, besides India, from which there were a few contributions, there was but one British Colony represented—British Guiana. In 1865 there were no less than twenty-one, more or less extensively represented; and had there been more time given, and more space available, there would have been more extensive and valuable contributions sent. The aggregate value of the Colonial contributions shown (exclusive of freight and supervision), amounted to nearly £17,000, as the following return will show, and the Indian collection was valued at close upon £70,000.

The following is an approximate estimate of the value of the Colonial collections shown, as obtained from the various commissioners, agents in charge, and others competent to furnish information :—

Bahamas, . . . . .	£250	Brought over, . . . . .	£4,165
Canada, . . . . .	1,750	New South Wales, . . . . .	250
Ceylon, . . . . .	30	New Zealand, . . . . .	20
Dominica, . . . . .	10	Nova Scotia, . . . . .	2,800
Falkland Islands, . . . . .	40	Queensland, . . . . .	350
Jamaica, . . . . .	200	Sierra Leone, . . . . .	200
Lagos, . . . . .	150	South Australia, . . . . .	30
Malta, . . . . .	950	Tasmania, . . . . .	5
Mauritius, . . . . .	250	Trinidad, . . . . .	5
Natal, . . . . .	500	Vancouver Island, . . . . .	40
Newfoundland, . . . . .	5	Victoria, . . . . .	9,000
Carried over, . . . . .	£4,165	Total, . . . . .	£16,865

## COLONIAL EXHIBITORS, DUBLIN EXHIBITION, 1865.

RETURN SHOWING THE NUMBER OF EXHIBITORS FROM EACH COLONY, AND THE DISTRIBUTION OF AWARDS AMONG THEM.

Colony	No. of Exhibitors	No. of Medals	No. of Hon. Mentions
Bahamas, - - -	7	—	2
Canada, - - -	82	25	25
Ceylon, - - -	2	—	—
Dominica, - - -	1	—	—
Falkland Islands, - - -	1	—	—
India, - - -	23	2	5
Jamaica, - - -	6	2	2
Lagos, - - -	1	—	1
Malta, - - -	13	3	—
Mauritius, - - -	41	6	10
Natal, - - -	24	3	3
Newfoundland, - - -	1	1	—
New South Wales, - - -	5	3	—
New Zealand, - - -	2	—	1
Nova Scotia, - - -	71	22	—
Queensland, - - -	6	1	1
Sierra Leone, - - -	2	—	—
South Australia, - - -	2	—	—
Tasmania, - - -	1	—	—
Trinidad, - - -	1	—	—
Vancouver Island, - - -	3	—	—
Victoria, - - -	149	35	60
	444	103	110

## COLONIAL POSSESSIONS.

(Generally in the North and West Galleries.)

## BAHAMAS.

## West Gallery.

THE population of the Bahamas islands has increased more than one-half in the last ten years. By the Census returns of 1861 the population stood at 35,487. The trade of the islands largely benefited during the late American civil war, owing to Nassau being the great shipping port for the Southern States. Whilst in 1853 the entries and clearances of vessels only reached 60,000 tons, in 1863 they amounted to 362,583 tons, of which 230,480 tons were British vessels. The productions are not numerous of this group of islands, but a large trade in salt and sponge is carried on, and renewed attention is being given to cotton cultivation, the Bahamas being the source from whence the Southern States derived their first seed supplies. The value of the imports to the Bahamas, which four or five years ago was under a quarter of a million, reached, in 1853, £4,295,316, of which £3,368,567 was re-exported. But this was only under the stimulus of supplies for the Southern States of America.

**1 COLLECTION CONTRIBUTED CHIEFLY BY HIS EXCELLENCY GOVERNOR RAWSON.**—Eighteen logs of indigenous woods, viz.:—Horseflesh; mahogany; naked wood; ebony; prince wood; cassada wood; dog wood; Madeira wood; white iron, black iron, white torch, crab, mastic, satin or yellow wood; lance wood; stopper, cedar, lignum vitae, and palmetto. Turpentine and resin—two new island products; fibre of the Pita plant and Manilla hemp (plantain); palmetto rope; do. hats, sold as low as 3d.; myrtle wax from the berries of *Myrica cerifera*; ornamental seeds of wild liquorice; (*Abrus precatorius*); Sea island cotton, Nankin cotton; knitted socks and mittens of Nankin cotton, from Harbour Island; salt, coarse and fine (largely produced in the islands); pink pearls from the conch shell (*Strombus pugilus*); ambergris; cascarilla and wild cinnamon bark; walking-sticks of Hercules club, crab wood, &c.

**2 ROBERTSON, Mrs. S.**—White shell-work basket, made by the exhibitor.

**3 GARNER, Mrs.**—Shell-work basket of coloured shells, made by the exhibitor.

**4 LOVE, Mrs.**—Mimosa seed reticules, made by the exhibitor.

**5 CLUTAM, Miss.**—Mimosa seed bracelets, dyed black, made by the exhibitor.

**6 MARSH, Miss.**—Mimosa seed bracelets, natural colour, made by the exhibitor.

**7 FARRINGTON, THEODORE.**—Ornamental fans and baskets of palmetto leaf; bundle of palmetto leaf; ornamental hats of do.; drip stones; five bales of fine and common sponge; helmet shells (*Cassia*) for cutting cameos; and a dozen large fine pink conch pearls.

## CANADA.

### A Brief Outline of Canada.

By WM. HUTTON, Esq. Published by Authority.

1. Canadians can well understand the expression of mingled wonder and regret which rose to the lips of Count Jaubert, when surveying the magnificent display of agricultural products from Canada, at the Paris Universal Exhibition:—"Now we can form an estimate of the value of those few acres of snow, ceded to England with such culpable carelessness by the government of Louis XV.;"\* for they know, from hard experience, that a name conveys no idea of the real wealth of a country, until that name becomes openly associated with the industry of its inhabitants and the triumphs they have won.

During centuries Canada has been spoken of as a distant and unprofitable waste, and not until the wonderful pageants of London and Paris, in 1851 and 1855, did she take her place among the producing nations of the Earth, and acquire the richly deserved descriptive title of "a land of hope not likely to be disappointed. Active, intelligent, enterprising beyond all other distinct nations, which equally abound in the elements of industrial production, she claims and demands our attention."†

In Europe it is usual to speak of "America and Americans" when any part of the Northern half of that great continent is referred to, while the existence of "Canada," as a distinct country, is ignored or unknown. The shadow of the great nation of "The United States of America" obscures it. Europeans too often think only of the latter when they give a thought at all to the North American Continent. Let it be our place to undeceive them and to show that Canada is a country totally distinct from the United States—free from the blight of slavery, and free, too, from many of the faults which have crept into the social and political relations of our Republican neighbours. A glance at a map will show the relative position of Canada and the United States.

\* La Botanique à l'Exposition Universelle de 1855.

† M. Treca.—A visit to the (Paris) Exhibition.

**2. THE GEOGRAPHICAL POSITION AND EXTENT OF CANADA.**—If an area be traced in Europe, corresponding generally to that occupied by Canada in America, and the meridian of the most southern part of Canada be supposed to lie upon the meridian of Greenwich, in England; the south of France, at the base of the Pyrenees, will represent the south frontier of Canada; the south-eastern boundary of this area will stretch through France, Switzerland, Bavaria, and Austria, to a point in the south of Poland, and a line drawn northward to Warsaw will delineate the mouth of the Gulf of St. Lawrence. The north-western boundary of this area will extend from the south of France, in a northerly direction, towards and beyond Brest; and a line drawn from near Brest to the British Channel, thence through England, Belgium, and Germany, to Warsaw again, establish the position of a European area corresponding to Canada in America. The inhabited and highly fertile portion of Canada is represented in this area by those regions which lie in the south, centre, and south-east of France, and in those parts of Switzerland, Bavaria, and Austria included within its boundary. The other portion, although of vast extent, and not so well fitted for extended agricultural operations, is highly valuable on account of its timber and minerals.

The Province of Canada embraces about 340,000 square miles of territory, independently of its north-western possessions, not yet open for settlement; it is consequently more than one-third larger than France, nearly three times as large as Great Britain and Ireland, and more than three times as large as Prussia. The inhabited or settled portion covers at least 40,000 square miles, and is nearly twice as large as Denmark, three times as large as Switzerland, a third greater than Scotland, and more than a third the size of Prussia; but such is the rapid progress of settlement through immigration, that, in ten years time, the settled parts of Canada will be equal in area to Great Britain or Prussia.

Prior to the year 1840, Canada was divided into two distinct provinces, known as Upper and Lower Canada, possessing separate Legislative bodies or Parliaments for the local government of each. In 1840 these provinces were united, although for some purposes the old territorial divisions still exist. Upper Canada is that part of the now united provinces which lies to the south and west of the River Ottawa; Lower Canada embraces the country to the north and east of the river.

This extensive province is bounded on the north by the British possessions, at present in the occupation or guardianship of the Hudson's Bay Company; on the south and east by the States of the American Union and the British province of New Brunswick. The western boundary of Canada, west of Lake Winnipeg, is yet undefined. The River St. Lawrence, and Lakes Ontario, Erie, St. Clair, Huron, and Superior, with their connecting rivers, form a wonderful natural barrier between Canada and the States of the Union, and a means of communication of surprising extent and unsurpassed excellence.

**3. THE NATURAL ADVANTAGES AND RESOURCES OF CANADA.**—In all new countries means of communication may be styled the pioneers of permanent improvement and expansion. Canada is especially fortunate in this respect; she possesses, without exception, the most magnificent system of natural and artificial water highways, in direct communication with the sea, to be found in either hemisphere. A ship sails from Liverpool, London, Bremen, Havre, Hamburg, Stockholm, or any other European port, and arrives at the mouth of the St. Lawrence, the great marine outlet of the commerce of Canada, and of the Far West. Let us ascend the St. Lawrence with her, and, without changing our vessel, unravel this water system from the ocean to the prairies of the Far West, through Canadian rivers, canals, and lakes.

Three hundred miles from the vast outlet of the River St. Lawrence we pass the mouth of the Saguenay, a deep and noble river, navigable for the largest vessels 70

miles from its outlet. Four hundred and ten miles sailing from the ocean we reach Quebec, the great seaport of Canada, with a large and increasing foreign commerce. Five hundred miles sailing finds us at the limit of tide-water, and we now begin in reality to ascend the stream of the St. Lawrence; 590 miles brings us to Montreal, near where the Ottawa, or Grand River of the North, mingles its red waters with those of the St. Lawrence, after draining a valley of 80,000 square miles in area, lying to the north-west, and thus commanding the inexhaustible treasures of the magnificent forests of a part of Canada, more than twice the size of Bavaria, or the Sardinian States, and six times the superficial limits of Holland.

It is at Montreal that those lasting monuments of enterprise, courage, and art begin to develop the secret of Canadian inland navigation. We have reached the St. Lawrence canal, seven in number; constructed for the purpose of overcoming the obstacles to continuous navigation presented by the rapids. These canals, of different lengths, and great capacity, fitted for sea-going vessels, enable us to ascend 116 miles of river in actual horizontal distance, overcoming a fall of 225 feet above the level of tide water. Fifty-two miles of sailing, 168 miles above Montreal, and we are in Lake Ontario, 756 miles from the sea and 234 feet above it. Lake Ontario is 180 miles long, from 50 to 60 miles wide, and 500 feet deep, and has an area of 6,600 square miles. Swiftly traversing its expanse, in sight, probably, of hundreds of other vessels and steamers, we reach the outlet of the Welland Canal, through which, by means of 27 locks, we rise 330 feet to the waters of Lake Erie, 1,041 miles from the sea and 564 feet above its level. Our progress is still on through Lake Erie, until we arrive at the Detroit river, 1,280 miles from the sea. We pass by the city of Detroit, in the State of Michigan, through Lake St. Clair and the St. Clair River into Lake Huron, 1,355 miles from our starting point, and 573 feet above the ocean. We may now sail on to St. Mary's river, and passing through a short but gigantic canal, constructed by the people of the United States, enter Lake Superior, with a fresh water sea, as large as Ireland, before us, and enabling us to attain a distance of 2,000 miles from the mouth of the St. Lawrence. Or, we may sail southward into Lake Michigan, and land at that wonderful creation of the Great West, Chicago. Choosing this latter terminus to our inland voyage, we find at our feet a net-work of railways spreading over the States and territories of the valleys of the Ohio, Mississippi, and Missouri.

Canadian merchants not unfrequently trace out this varied navigation of lake, river, and canal we have been unravelling, but in a contrary direction, and proceed to Europe, selling their cargoes and ships. In 1856 the American vessel, *Dean Richmond*, laden with produce at Chicago, passed the Canadian canals and waters and excited unbounded astonishment at Liverpool; but the year previous the Canadian vessel, *Reindeer*, built at the same water level, and traversing the same route, excited no further curiosity at London than a hopeless enquiry of "where is Lake Huron!" Since the Paris and London Exhibitions, however, all is changed. Canada begins to be known and "demands attention," and men who formerly affected ignorance of her political or commercial existence, are studying the future of that "land of hope which is not to be disappointed." Now a dozen vessels often sail annually from Chicago to Great Britain.

The natural advantages conferred upon Canada by the St. Lawrence River and the great Lakes are not merely immense, they are incalculable. Immediate and direct water communication with the sea for 2,000 miles of inland coast, without any reference to the nearly equal extent of coast belonging to the States of the Union, or the vast affluents which feed the St. Lawrence and the lakes, striking deep into the heart of the country, appears in itself sufficient to mark out Canada for a distinguished future; but when the influence which her vast inland seas exercise upon

climate, vegetation, health, and internal commerce is understood, the character of that future may be partially foretold, even in the youth of Canadian history, and before her enterprise and capabilities have become fully known and appreciated.

Water power, that mighty engine of industry, is everywhere abundant, and just where it is required, in the midst of magnificent forests of valuable lumber, for which an inexhaustible market is springing up in the Far West prairie region of the American Union, as well as in France and England, where, too, a demand is growing (almost too rapidly for the means of supply) for the more valuable kinds of cabinet-work woods, with which the Canadian forests abound.

There are now 1,900 miles of railway in operation in Canada, independent of the Grand Trunk extension to Portland, which, 164 miles in length—though running through the United States, to secure an ocean port in Winter—is really a Canadian road. It is worthy of remark that Canada has now more miles of railway open than Ireland or Scotland, or any one of the New England States—more than the three Atlantic States of New Jersey, Delaware, and Maryland; or the two Carolinas, North and South; and more, in proportion to its population, than any other country in the world. The opening of the Victoria Bridge, and the section between St. Mary's and Detroit, have brought the Grand Trunk into unbroken operation, and it will now be able to transport passengers and goods, from the Atlantic to the Mississippi, with but one transshipment, and a saving, it is alleged, of five days over all other routes.

**MINERALS.**—The triumph obtained by Canada, at the Paris and London Exhibitions, for her splendid display of minerals of all descriptions, tells its own tale. The grand Medal of Honour, awarded to Sir William Logan, the Canadian Provincial Geologist, by the Jurors of the Paris Exhibition, will do more in calling the attention of European capitalists to the vast mineral wealth of the country than the most elaborate description of its distribution and extent. It was a prize won in a strife where all were strong, and tells of rare industry and success in bringing to light the hidden wealth of Canadian rocks.

The principal economic minerals of Canada, are stated by Sir W. Logan, to be:—

#### METALS, AND THEIR ORES.

Magnetic iron ore; specular iron ore; limonite (bog ore); titaniferous iron; sulphuret of zinc (blende); sulphuret of lead (galena); copper, native, sulphuret of, variegated; copper pyrites; argentiferous do., and containing gold; nickel; silver, with native copper and sulphuret of silver; gold.

#### NON-METALLIC MINERALS.

Uranium; chromium; cobalt; manganese; iron pyrites; graphite; dolomite; carbonate of magnesia; sulphate of barytes; iron ochres; atextile; lithographic stone; agates; jasper; felspar; aventurine; hyacinth; corundum; amethyst; jet; quartzose; sandstone; retinite and basalt; gypsum; shell marl; phosphate of lime; millstones; grindstones; whetstones; tripoli.

#### BUILDING MATERIALS.

Granites, sandstone, calcareous sandstone, limestones, hydraulic limestones, roofing slates, flagging stones, clays, moulding sand; fuller's earth. Marbles—white, black, red, brown, yellow and black, grey and variegated, green.

**COMBUSTIBLES.**—Peat, petroleum, asphaltum.

Many of the mines are now being actually worked, and the "raw material" only waits the application of capital and skilled labour to reward enterprise and industry.

The FISHERIES belonging to the province are attracting much attention, and will no doubt prove a productive source of wealth. They are inexhaustible, and are now subject to a regular system of licensing. Inspectors have been recently appointed, and every endeavour is being made to preserve them and encourage their increase. They are, but as yet, in their infancy, and a brief statement of them is here given, showing their extent and their value even in the very limited use of them now made.

Lower Canada possesses, in the River and Gulf of St. Lawrence, an extent of coast of 1,000 miles, where the cod, herring, mackerel, salmon, and other fisheries are carried on successfully. Whale fishing is also carried on by vessels fitted out from the port of Gaspé. Average season value of whale oil has been about \$27,000.

The cod fishery is carried on along the whole shore of Canada. The herring fishing principally at the Magdalen Islands, in the Bay of Chaleurs, and on the coast of Labrador. The mackerel fishing at the Magdalen Islands, along the coast of Gaspé, and in the lower part of the River St. Lawrence.

There are above seventy salmon fishery rivers in Lower Canada, which the Government are now fostering, with a view to enhance the commerce in this valuable fish. The latest annual catch is 3,750 barrels. The Bay of Chaleurs alone formerly exported 10,000 barrels.

The number of boats belonging to Canada, fishing on the Canadian shore, is from 1,200 to 1,500.

Nearly 100 Canadian vessels are employed in the fisheries of Canada. The number of fishing vessels from Nova Scotia and the other lower provinces, fishing on our shores, is from 250 to 300.

The number of fishing vessels, from the United States, frequenting our shores, principally for the cod and mackerel fishing, is from 200 to 300.

Quantity of dried and smoked fish	yearly exported from Canada,	- 846,567 quintals.
Quantity of pickled fish exported from	Canada,	- 118,257 barrels.
Consumed in Canada, above kinds,	- 75,000 quintals.	
Quantity of fish oil exported from	Canada,	- 100,218 gallons.
Number of seal skins do. do.,	- 12,000	
Quantity of salmon taken in the rivers	of Canada,	- 3,750 barrels.
Quantity of trout and halibut taken in	Canada,	- 900 barrels.

Total fish productions in 1860, valued at \$942,528.

The take by vessels, other than Canadian, is not computed in this table.

Square and manufactured timber is exported in large quantities from the different ports of the coast of Gaspé. There is also found an abundance of wood of the best quality for ship-building purposes. The lands in the district of Gaspé are composed of a light but fertile soil, producing all kinds of grain and vegetables. There are millions of acres of those lands which are still in the wild state and covered by beautiful forests.

The population of the district of Gaspé and of the north coast of the River and Gulf of St. Lawrence is 32,000 souls. The District of Gaspé alone could contain and support a population of more than 100,000. The inland lakes and rivers abound in fish.

The merchantable fish products derived from the lakes and rivers of Upper Canada consist chiefly of white fish, salmon, salmon-trout, herring, lake-trout, speckled-trout, sturgeon, pickerel, bass, mascalonge, &c. Inferior kinds also abound in the smaller lakes, tributaries and streams.

The extensive area, great depth, clear, cold waters, abundant feeding banks, shoals, and spawning grounds, of the principal Upper Canadian lakes, render the fish found therein numerous, of good quality, and large size. The annual take of the different species of fish is carefully estimated at \$380,000 value. This produce is variously disposed of, by export, fresh and cured, to the neighbouring United States, and for domestic sale and consumption. Ready markets are found, both at home and abroad, for any seasonable catch. Tracts of arable land, bordering on the great lakes, are still at the disposal of the Government for sale and settlement.

4. HER FORM OF GOVERNMENT AND CONNEXION WITH GREAT BRITAIN.—Canada is a colony of Great Britain, but is as free and unfettered as an independent nation. The wisdom of the mother country has entrusted to Canadians the management of their own affairs. The Governor of Canada, who is also Governor-General of

British North America, is appointed by the British Crown, and is its representative in the colony. He nominates an executive council, who are his advisers on all matters. There are two legislative bodies, called the House of Assembly and the Legislative Council, the members of which are elected by the people. The Legislative Council was formerly filled by nominees of the Crown.

The system of government is that of legislative majorities, and responsibilities to electors, in imitation of, and as similar as possible to that which exists in Great Britain. All public offices and seats in the legislature are open to any candidate possessing the confidence of the people, and holding a certain limited amount of property, and being at the same time a British subject. The elective franchise is nearly universal. Every man paying an annual household rental of 30 dollars (£6 sterling), in the cities and towns, and 20 dollars (£4 sterling), in the rural districts, is entitled to vote.

Aliens or foreigners can acquire and hold lands; and when naturalized, which takes place under the easy conditions of three years' residence and taking the oath of allegiance, they enjoy the full privileges of natural born British subjects, in electoral and all other matters.

The British Government maintains a small force in Canada and the neighbouring provinces for protection against foreign invasion, and for the maintenance and preservation of the fortifications of Quebec, Kingston, and other places, in the event of a foreign war. While, therefore, the connexion of Canada with Great Britain secures her against all foreign aggression, she enjoys the largest measure of political liberty possessed by any people, and exercises entire control over her internal commerce, laws, municipal institutions, taxation, religion, and education. All her internal relations between government and people are those of a distinct and independent nationality; her external relations are in a measure controlled by the mother country; but, as an instance of the liberality which distinguishes the latter, Canada has been allowed to make her own arrangements with foreign governments, in Europe and America, for the conveyance of mails and postal matters between and over the continents, thus enabling her to assume, even in her foreign relations, the character of a nation. Such is the connexion which exists between the Imperial Government and her colonial offspring. It may now be said that it is the earnest wish, and even the aspiration of every true Canadian, that this connexion may grow to a more intimate union in all commercial relations with the people of Great Britain and Ireland, and in all sympathies which can draw fast and sure the bonds of friendship between distant nations of the same origin, government, and blood.

5. THE CHARACTER OF THE POPULATION OF CANADA—HER CITIES AND TOWNS.—Canada was once a French colony, and until it was ceded to the British, possessed, exclusively a French population. In that part of the province which lies to the north and east of the Ottawa river, and which is called Lower Canada, the people are chiefly of French extraction. West of the Ottawa, or Upper Canada, they are, for the most part, British. The population of the province is now about 3,000,000. In several parts of the province there are large colonies of Germans and Dutch, and some Norwegians; and it is probable that not less than 40,000 of these nations are already settled here. They are highly prosperous.

The rise and progress of cities and towns in Canada afford a curious and most instructive illustration of the expansion of the country, the development of its resources, the increase of its wealth, and the activity and energy of its people. Montreal is the largest city in Canada, and contains about 91,000 inhabitants; Quebec ranks next, with about 52,000; Toronto, third, with 45,000. In 1831 Montreal and Quebec contained a population of about 27,000 each. The history of Toronto foreshadows the history of other towns in Canada. In 1842, a period so recent that most will remember it, Toronto contained 13,000 inhabitants; in

1852, 30,763; and in 1861, 44,743. Toronto is situated on Lake Ontario, and may be considered as the type of a thriving commercial Canadian port on one of the great lakes. One more example will suffice, and that one is taken from the centre of a fine agricultural district:—London, in Upper Canada, contained, in 1850, 5,124 inhabitants; its population in 1864 exceeded 15,000, a nearly threefold increase in 14 years.

These startling instances of sudden growth are by no means exceptions to the rule; other towns and cities are not deprived of their population to swell that of more favoured and prosperous communities, nor is the country drained to feed the towns. On the contrary, the progress is general; increase is the rule throughout, both in cities and rural districts.

Everywhere postal communication is complete; the most distant hamlet has its post-office, and the number of offices in Canada is now about 1,720. The electric telegraph passes through every town and almost every village in the province, and the number of miles in operation at this time is 4,046. The approach and arrival of a steamer or sailing vessel at Quebec is known very nearly at the same moment in every town of the Lower and Upper portions of the Province. All improvements in the arts and sciences affecting the commercial or industrial interests of her people are quickly introduced into Canada, and, with numerous elements of adaptation and progress within her reach, she eagerly avails herself of the practice and enterprise of other countries.

The great and unfailing source of this steady growth, this quiet but irresistible onward movement of Canada, has been IMMIGRATION; the infusion of new blood, the adoption of a new and prosperous home by tens of thousands from across the seas and beyond the frontiers; a home which, with all its immunities, privileges, and hopes, is offered, requiring no other return than a strong arm, a willing heart, and a confident self-relying trust in the future, and in the happiness and prosperity of your adopted country. This invitation, though feebly proffered hitherto, because not coupled with the positive advantages which Canada now enjoys, has succeeded in winning to her shores and fortunes, within the past twelve years, a full half million of stout and trusting hearts.

6. THE LAWS AND MUNICIPAL INSTITUTIONS OF CANADA.—It is no exaggeration to say, that the Canadas enjoy more thorough rational freedom than any country in the world.

The laws of England were introduced into Upper Canada in 1791, and prevailed, subject to the various alterations made from time to time by the local Parliament. The laws of France, as they existed at the conquest of Canada, by Britain, prevail in Lower Canada, subject also to the alterations effected by the local Parliament. The criminal and commercial laws of England prevail there, as in Upper Canada. The Parliament of Canada exercises entire control over the province; the Imperial Government never interferes now, unless (which scarcely ever occurs) some great national interest is involved.

The municipal system of Canada is admirably adapted to the exigencies of a young and vigorous country; its success has been complete. In order to comprehend it, it is necessary to state that Upper Canada is divided into counties, forty-two in number; each county is divided into townships, so that, on an average, each township is about ten miles square. The inhabitants of a township elect five "councillors," the councillors elect out of this number a presiding officer, who is designated the "town reeve;" the town reeves of the different townships form the "county council;" this council elect their presiding officer, who is styled the "warden." The town council and county council are municipal corporations, possessing the power to raise money for municipal purposes, such as making public improvements, opening and repairing roads and bridges. Repayment is secured by a tax on all the

property in the township or county where the debt is incurred; but no by-law for raising money can be enforced, unless it has been previously submitted to the electors or people. Each corporation possesses the power of suing, and is liable to be sued, and their by-laws, if illegal, are subject to be annulled by the superior courts of the province, at the instance of any elector.

Each township council has the power to provide for the support of common schools under the provisions of the school law; to construct roads, bridges, water-courses, &c., to appoint path-masters or road inspectors, &c. The county councils are charged with the construction and repairs of gaols and court-houses, roads and bridges, houses of correction, and grammar schools, under the provisions of the school law; to grant moneys by loan to public works, tending to the improvements of the country, and to levy taxes for the redemption of the debts incurred, subject to the proviso before mentioned, namely, the vote of the people. Villages not having a population over 1,000 are governed by a board of police, and are styled police villages; possessing over 1,000 inhabitants, they become incorporated villages, and are governed by a council of five, whose reeve is a member of the county council, *ex officio*; as soon as a village acquires a population exceeding three thousand, it becomes a town, governed by a mayor and council, and is represented in the county council by a town reeve and deputy town reeve. When the number of inhabitants exceeds 10,000 it may be created a city, and is governed by a mayor, aldermen, and councilmen. All town reeves, wardens, mayors, and aldermen are, *ex officio*, justices of the peace.

In Lower Canada the same system prevails, and though it has not been as fully developed as in Upper Canada, it is in rapid progress.

7. EDUCATIONAL INSTITUTIONS IN CANADA.—Upper and Lower Canada enjoy separate School Laws adapted to the religious element prevailing in either. Each Township in Upper Canada is divided into several School Sections, according to the requirements of its inhabitants. The Common Schools are supported partly by government, and partly by local, self-imposed taxation, and occasionally by the payment of a small monthly fee from each scholar. The total amount expended on common schools in Upper Canada during 1863 exceeded £51,000, sterling. In long settled rural districts each school section is now distinguished by a handsome brick school-house, furnished with maps, authorized school books, and elementary philosophical apparatus. The salaries of teachers vary from £130 sterling to £40 sterling in country parts, and from £280 sterling to £75 sterling in cities and towns. All common school teachers must pass an examination before a County Board of Education, or receive a license from the Provincial normal school, empowering them to teach, before they can claim the government allowance.

The Provincial Normal School for Upper Canada is a highly effective and useful institution for the training of teachers, and annually sends forth from 100 to 150 young men and women, who, having been uniformly instructed in the art of conducting a school, and communicating knowledge, are gradually establishing in Upper Canada a system of common school education of great promise.

In 1842 the number of common schools in Upper Canada was 1,721, attended by 65,978 children; in 1863 the number of schools was 4,013 attended by 345,000 children, and the average time during which the schools were open was 10 months and a-half. This astonishing increase in so short a period speaks volumes for the condition and progress of elementary education in Upper Canada. Each school section is governed by an elective corporation, styled School Trustees, and is supplied, partly at government expense, with a small library of selected literature. The number of volumes which have already been distributed for this purpose amounts to 691,803.

The free school system is gaining ground in many parts of Canada; the principle it involves implies the support of common schools, open to all, by a general tax, and the non-exaction of fees. Any school section may adopt it by the vote of the majority of its inhabitants. Separate schools for Roman Catholics are sanctioned under certain regulations.

The grammar schools, in 1863, were 95 in number, with 5,352 pupils. They are intended to form a connecting link between the common schools and the universities. Teachers must be graduates of some university; they receive an allowance from government in addition to fees. The amount raised for grammar school purposes in 1863 was £18,000 sterling.

Besides a richly endowed provincial university, supplied with a complete staff of highly competent professors and lecturers, there are several other universities and colleges in Upper Canada in connexion with different religious denominations. The standard of education adopted in some of the Canadian universities assimilates as closely as possible to that established in the time-honoured institutions of Great Britain and Ireland, and the ranks of the professorial staffs are generally supplied from the same unfailing sources. All the expenses of a full University course in Toronto, need not exceed £60 sterling per annum, board and tuition included. To the Provincial University, and to the University of Trinity College, in connexion with the Church of England, scholarships are attached, which vary in value from £18 sterling to £40 sterling, per annum. These are awarded (at annual examinations) to successful candidates competing for them.

The educational statistics of Upper Canada may be thus summed up:—In 1863 there were in actual operation 16 universities and colleges; 95 grammar schools, academies and private schools, 340; and 4,013 common schools; making in the aggregate 4,588 educational institutions, teaching 360,000 pupils and students, and costing the country, in great part by self-imposed taxation, £324,000 sterling.

In Lower Canada a system of education, in most respects similar to that which has just been described, exists, and is rapidly obtaining favour among the people. The superior schools there are of a very high order, and many of the seminaries attached to religious houses are well endowed and amply provided with efficient professors and teachers.

In addition to the Laval University and McGill College, the educational institutions in Lower Canada are thus classed in the report of the superintendent of education for the year 1858:—

Superior Schools, . . . 10;	No. of Pupils, . . . 438
Secondary do. . . . 170;	No. of Pupils, . . . 25,224
Normal do. . . . 3;	No. of Pupils, . . . 213
Special do. . . . 2;	No. of Pupils, . . . 59
Primary do. . . . 2,800;	No. of Pupils, . . . 130,940
Total No. of Schools, 2,985;	Total No. Pupils, 156,872
Total of Contributions, . . . . .	£91,879 Sterling.

The increase in the number of pupils was, in 1858, 7,188, against 6,557 in 1857; and the increase in contributions since 1856 amounts to \$52,632. Every year will witness great extension. The cost of a full course of superior education in Lower Canada is even less than that in Upper Canada.

8. RELIGION IN CANADA.—Among Canadians there is perfect toleration in religious matters. While, however, all religions are respected by law and by the people, there are strict distinctions jealously preserved between churches of different denominations. The Lower Canadian French are distinguished for social habits and quiet religious zeal; and in no country, not even England or Scotland excepted, can there be found so uniform an observance of the Sabbath in accordance with strict Protestant views, as in Upper Canada.

The prevailing religious denominations may be thus classified according to the census of 1861, from which an idea may be formed of the present strength of each

leading religious body:—Church of England, 375,052; Church of Scotland, 132,693; Church of Rome, 1201,894; Free Presbyterians, 157,899; other Presbyterians, 56,527; Wesleyan Methodists, 244,306; Episcopal Methodists, 74,152; all other Methodists, 53,696; Baptists, 69,310; Lutherans, 25,156, &c. An addition of 50 per cent. to the above numbers will give an approximation to the relative strength of each denomination at the present time, June, 1865. In Upper Canada the Roman Catholics form about one-fifth of the whole population, and in Lower Canada about five sixths.

9. AGRICULTURAL CAPABILITIES OF THE SOIL.—A reference to the display of cereals and other agricultural productions made by Canada at the exhibitions of London, Paris, and Dublin, might be considered sufficient to illustrate the remarkable adaptation of the soil to their growth and cultivation; but so limited a notice would leave the question of permanent fertility still unanswered. When, however, it is known that the area in which the astonishing crops of wheat are raised, for which Upper Canada is so justly distinguished, extends over three-fourths of the present inhabited parts of the country, and that the prevailing soils consist of rich clays of great depth, the question of permanent fertility resolves itself into that of husbandry.

In the valleys of some of the larger rivers of Upper Canada, wheat has been grown after wheat for twenty years; the first crops yielded an average of 40 bushels to the acre, but under the thoughtless system of husbandry then pursued, the yield diminished to 12 bushels to the acre, and compelled a change of system, which soon had the effect of restoring the land to its original fertility. This system of exhaustion has effected its own cure, and led to the introduction of a more rational method of cultivating the soil. Years ago, when roads were bad, and facilities for communicating with markets few and far between, wheat was the only saleable produce of the farm, so that no effort was spared to cultivate that cereal to the utmost extent. Now, since railroads, macadamized roads, and plank roads have opened up the country, and agricultural societies have succeeded in disseminating much useful instruction and information, husbandry has improved in all directions, and the natural fertility of the soil of the old settlements is in great part restored.

The average yield of wheat in some townships exceeds 22 bushels to the acre, and where an approach to good farming prevails the yield rises to 30 and often 40 bushels to the acre. On new land 50 bushels is not very uncommon; and it must not be forgotten that Canadian wheat, grown near the city of Toronto, won a first prize at the Paris Exhibition. It may truly be said that the soil of what may be termed the agricultural portion of Canada, which comprises four-fifths of the inhabited portion, and a vast area still in the hands of the government and now open to settlement, is unexceptionable; and when deterioration takes place, it is the fault of the farmer and not of the soil. In Canada the yield of wheat in 1859 considerably exceeded 25,000,000 bushels; and the quality of Canadian wheat is so superior, that the American millers buy it for the purpose of mixing with grain grown in the United States, in order to improve the quality of their flour, and in some instances to render it fit for exportation.

10. VALUE OF LAND—FREE GRANTS.—Australia excepted, no country can furnish such singular instances of the rise in value of surveyed lands, as the last seven years have witnessed in Canada. The cause, too, is so obvious, now that it is understood, that men wonder why the event had not been foreseen years before its occurrence. The reason is fully conveyed in the assertion that the country was not prepared for it. Eighteen hundred and fifty-two saw Canada without a railway; eighteen hundred and sixty saw her with 2,000 miles completed, and many more in process of construction. The rise in the value of land is thus easily explained. Means of communication of the highest order have opened up the country, made available a vast amount

of inert wealth, stimulated industry, and effected a complete revolution in farming economy within 20 miles on either side of the course they pursue.

The lines of railways are nothing more than a series of accessible markets for the country they serve. The natural consequence is that every portable product of the farm has acquired a certain money value, although, before the construction of the railway, it may have been absolutely valueless, and perhaps even an incumbrance. This suddenly increased rate of interest obtained for the same outlay of labour, has necessarily enhanced the value of the capital. Hence, land in old settlements, remote from lake ports, has doubled itself in value in seven years; while wild land, in new settlements, near to which a railway passes, has been trebled, and in some instances quadrupled in value during the same period.

Land adapted for farming purposes can seldom be obtained from land companies, speculators, or private individuals, under twenty shillings an acre. The Canadian Government being desirous of preventing the acquisition of large tracts of lands by private companies, or private individuals, for the purpose of speculation, have coupled the sale of the government lands with such conditions as to prevent undue or improper advantage being taken of their liberality in offering farming land at a low rate. Every purchaser must become an actual settler. This simple condition drives out of the field a host of speculators who hitherto enriched themselves at the expense of the country, retarding its progress, and leaving its resources undeveloped.

The Provincial Government has recently opened seven great lines of road in Upper Canada, and five in Lower Canada, and laid out for settlement the lands through which these roads pass.

In order to facilitate the settlement of these parts of Canada, the government has authorised free grants of land along these roads—not exceeding, in each case, 100 acres, and obtainable upon the following conditions:—1st.—That the settler be eighteen years of age.

2nd.—That he take possession of the land allotted to him within one month.

3rd.—That he put into a state of cultivation 12 acres of land in the course of four years.

4th.—That he build a log-house, 20 by 18 feet, and reside on the lot until the foregoing conditions are fulfilled.

Families may reside on a single lot, and the several members having land allotted to them will be exempt from building and residence upon each individual lot. The non-fulfilment of these conditions will cause the immediate loss of the land, which will be sold or given to another. The lands thus opened up, and gratuitously offered by the government for settlement, are chiefly of excellent quality, and well adapted, in respect of soil and climate, to all the purposes of husbandry.

The reports of the resident agents on these roads convey the most favourable accounts of the prosperity of the settlers thereon, and of the large amount of produce they have raised on the newly-cleared lands.

In addition to the free grants along these lines of road, the government have at their disposal several millions of acres, which may be purchased by persons intending to become actual settlers, at prices varying from one shilling to five shillings per acre.—(10d. to 4s. sterling). It may also be stated here, that other lines of road have been made, or are in course of construction, in different parts of the province.

In the eastern townships there remains a large tract, nearly 2,000,000 acres of land, yet for sale. It is intended to open it up, and render it available to settlers, by colonization roads. This district is well known for its agricultural capabilities of all kinds, and especially as a grazing and dairy country; it is also abundantly provided with water-power for manufacturing purposes. The population consists, more than any other portion of equal extent in Lower Canada, of English, Scotch, and Irish—and a large and thriving

settlement of Norwegians has recently been formed therein. The mineral riches of the townships, especially in copper, are well ascertained, and several mines are now being profitably worked.

The whole district is accessible, all the year round, by railway or steam boat accommodation, and has ready communication with the markets of Quebec, Montreal, Portland, Boston, and New York.

11. THE CLIMATE OF CANADA.—The most erroneous opinions have prevailed abroad respecting the climate of Canada. The so-called rigour of Canadian winters is often advanced as a serious objection to the country by many who have not the courage to encounter them, who prefer sleet and fog to brilliant skies and bracing cold, and who have yet to learn the value and extent of the blessings conferred upon Canada by her world-renowned "snows."

It will scarcely be believed by many who shudder at the idea of the thermometer falling to zero, that the gradual annual diminution in the fall of snow, in certain localities, is a subject of lamentation to the farmer in Western Canada. Their desire is for the old fashioned winters, with sleighing for four months, and spring bursting upon them with marvellous beauty at the beginning of April. A bountiful fall of snow, with hard frost, is equivalent to the construction of the best macadamized roads all over the country. The absence of a sufficient quantity of snow in winter for sleighing is a calamity as much to be feared and deplored as the want of rain in spring. Happily neither of these deprivations is of frequent occurrence.

The climate of Canada is in some measure exceptional, especially that of the peninsular portion. The influence of the great lakes is very strikingly felt in the elevation of Winter temperatures and in the reduction of Summer heats. East and West of Canada, beyond the influence of the lakes, as in the middle of the States of New York and Iowa, the greatest extremes prevail—intense cold in Winter, intense heat in Summer, and to these features may be added their usual attendant, drought.

Perhaps the popular standard of the adaptation of climate to the purposes of agriculture is more suitable for the present occasion than a reference to monthly and annual means of temperature. Much information is conveyed in the simple narration of facts bearing upon fruit culture. From the head of Lake Ontario, round by the Niagara frontier, and all along the Canadian shores of Lake Erie, the grape and peach grow with luxuriance, and ripen to perfection in the open air, without the slightest artificial aid. The island of Montreal is distinguished everywhere for the fine quality of its apples, and the island of Orleans, below Quebec, is equally celebrated for its plums. Over the whole of Canada the melon and tomato acquire large dimensions, and ripen fully in the open air, the seeds being planted in the soil towards the latter end of April, and the fruit gathered in September. Pumpkins and squashes attain gigantic dimensions; they have exceeded 300 pounds in weight in the neighbourhood of Toronto. Indian corn, hops, and tobacco, are common crops and yield fair returns. Hemp and flax are indigenous plants, and can be cultivated to any extent in many parts of the province. With a proper expenditure of capital, England could be made quite independent of Russia, or any other country, for her supply of these valuable products.

The most striking illustration of the influence of the great lakes in ameliorating the climate of Canada, especially of the western peninsula, is to be found in the natural limits to which certain trees are restricted by climate. That valuable wood, the black walnut, for which Canada is so celebrated, ceases to grow north of latitude 41° on the Atlantic coast, but under the influence of the comparatively mild lake climate of Peninsular Canada it is found in the greatest profusion, and of the largest dimensions, as far north as latitude 43°.

12. TRADE AND REVENUE.—The general revenue of

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the province is derived from customs, government land sales, revenue from public works and minor sources of income; government or provincial taxation never reaches the Canadian in a direct manner, and if he choose to limit his wants to the simple necessities of life, and clothe himself, as tens of thousands do, in home spun—the stamp of domestic industry and frugality—indirect taxation will only meet him in the articles of tea or coffee, each of which cost about one-half as much as they do in Britain. The only taxes he is called upon to pay he has the opportunity of voting for or against; his opinion, in other words, is taken as to whether the tax is just or necessary. Such taxes are for school purposes, road-making and bridge-building in the township in which he lives, and by which he benefits to a degree often one hundred-fold greater than the amount of money or labour he is required to contribute.

13. CANADA AS A FIELD FOR REMUNERATIVE INDUSTRY.—The motto of the capital of Canada is "Industry, Intelligence, and Integrity," and her emblem is the Beaver. These three qualifications are required by all who desire to make speedy and honourable progress in life, and when possessed and exercised they cannot fail, humanly speaking, to command success in Canada. There are no monopolies, exclusive privileges, or great and impassable gulf, between grades of society, such as exist in Britain, to check or arrest the progress of the honest and industrious man.

Many of the wealthy and respected people in Canada landed in her territory without a friend to receive them, or a shilling to provide for the wants of the morrow; and there are thousands of new arrivals who throng the quays of Quebec during the Spring and Summer months, to whom the future seems doubtful and dark, but who will most assuredly find themselves a few years afterwards enjoying the luxury of well-earned independence, with ample and increasing provisions for declining years or a growing family.

Canada offers a market for the produce of the world; and, in the bold stride which she is making for greatness, she challenges competition and rivalry in its commerce. Every necessary and luxury of life, to be obtained in Europe or elsewhere, is procurable in the province.

### *The Agricultural and Mineral Resources of Canada.*

By J. STERRY HUNT, Esq.

IN the eastern division of Canada a line drawn from Quebec to Ottawa, and two others from these points, converging at the outlet of Lake Champlain, will enclose a triangular area of about 9,000 square miles, which is very nearly that occupied by the marine clays. These are overlaid, chiefly around the borders of this space, by more sandy deposits, which are well seen near Three Rivers, and about Sorel. They form a warm but light soil, which yields good crops when well manured, but is not of lasting fertility. The greater part of this area, however, is covered by a tenacious blue clay, often more or less calcareous, and of great depth, which constitutes a strong and rich soil bearing in abundance crops of all kinds, but particularly adapted for wheat, and was in former times noted for its great fertility. These clay lands of Lower Canada have been for a long time under cultivation, and by repeated cropping with wheat, without fallow, rotation, deep ploughing, or manure, are now in a great many cases unproductive, and are looked upon as worn out or exhausted. A scientific system of culture which should make use of deep or sub-soil ploughing, a proper rotation of crops, and a judicious application of manures, would, however, soon restore these lands to their original fertility. The few trials which within the last few years have been made in the vicinity of Montreal, and elsewhere, have sufficed to show that an enlightened system of tillage, with sub-soil draining, is eminently successful in restoring these

lands, which offer at their present prices good inducements to skilled farmers. Besides grain and green crops, these soils are well fitted for the culture of tobacco, which is grown to some extent in the vicinity of Montreal. Notwithstanding the length of the Winter season in Canada, the great heat and light of the Summer and the clearness of the atmosphere enable vegetation to make every rapid progress.

The mineral resources of this champaign region of Eastern Canada are chiefly confined to stones for building, paving, lime and cement, stone for glass-making, and peat. Large peat-bogs are very numerous in various parts of this region, and may be made to furnish an abundant supply of fuel. This part of the country is also remarkable for the great number and variety of its mineral springs.

To the north-east of Quebec, besides the plains which border the river, there is a considerable area of low-lying clay land, cut off from the great St. Lawrence basin by Laurentian hills, and occupying the valley of Lake St. John and of a portion of the Saguenay. Here is a small outlying basin of Lower Silurian rocks, like those about Montreal, and overlaid in like manner by strong and deep clays, which extend over the adjacent and little elevated portion of the Laurentian rocks, and form a soil as well fitted for cultivation as any part of the lower St. Lawrence valley. The valley of this lake is probably not more than 300 feet above the sea; and from its sheltered position the climate is not more rigorous than that of Quebec. Several townships have within a few years been laid out in this valley, and have attracted large numbers of French Canadians from the older parishes in the valley of the St. Lawrence.

The western part of the champaign region, commencing near Kingston and including all the southern portion of the western province, is the most fertile and productive part of Canada. Like the plains further eastward, its soils consist chiefly of strong clays, overlaid here and there by loam, sand, and gravel. In the natural state nearly the whole of this region supported a fine growth of timber, in great part of broad-leaved species, but presented, however, various local peculiarities. Thus, the banks of the Grand River from Galt to Brantford were remarkable for a sparse growth of oaks, free from underwood, and known as oak openings. These are said to have been pasture grounds of the Indians, brought to this condition and kept in it by partial clearing, and by the annual burning of the grass. The object of this was to attract the deer who came to feed upon the herbage. (See, on this point, *Marsh's Man and Nature*, page 137.) The soil of these plains is a light sandy loam, very uniform in character, and generally underlaid by coarse gravel. Though fertile, and of an easy tillage, this and similar soils will not support the long continued cropping without manure, which is often practised on the clay lands of both Upper and Lower Canada.

The valley of the Thames, together with the rich alluvial flats which extend from it northward to the north branch of Bear Creek, and southward nearly to the shore of Lake Erie, is remarkable for its great fertility, and its luxuriant forest growth. The soil is generally clay, with a covering of rich vegetable mould, and is covered in the natural state with oak, elm, black-walnut and white-wood (*Liriodendron tulipifera*) trees of large size, together with fine groves of sugar maple. Towards the mouth of the Thames, and on the borders of Lake St. Clair, is an area of natural prairie of about 30,000 acres. It lies but little above the level of the lake, and is in large part overflowed in the time of the spring floods. The soil of this prairie is a deep unctuous mould, covered chiefly with grass, with here and there copses of maple, walnut, and elm, and with willows dotting the surface of the plain. Numbers of half-wild horses are pastured here, and doubtless help to keep down the forest growth. The characters of the surface are such as to suggest that it had been at no distant period reclaimed from the waters of the adjacent lake.

In no part of the province have skilled labour and capital been so extensively applied to agriculture as in Western Canada, and the result is seen in a general high degree of cultivation, and in the great quantities of wheat and other grains which the region annually furnishes for exportation, as well as in the excellent grazing farms, and the quantity and quality of the dairy produce which the region affords. This western portion of the province, from its more southern latitude, and from the proximity of the great lakes, enjoys a much milder climate than the other part of Canada. The Winters are comparatively short, and in the more southern sections the peach is successfully cultivated, and the chestnut grows spontaneously.

The mineral resources of this region, like those of the eastern portion of the champaign district, are comparatively few. Besides building-stones, lime, and cements, however, may be added gypsum and petroleum.

*Artificial Manures.*—In addition to the manures which are the produce of the farm, modern agriculture avails itself of various other materials which are capable of restoring to the soil the elements removed by tillage, or in other ways of promoting the growth of vegetation. Of the more common of these materials, lime and gypsum, Canada contains an abundant supply. Deposits of white calcareous marl abound in a great many lakes and marshy grounds throughout Canada, and being pure carbonate of lime, constitute a valuable manure for soils lacking this element.

*Gypsum* is found in great abundance for a distance of about thirty-five miles along the Grand River in Western Canada, and large beds of it are opened at Cayuga, York, Seneca, Brantford, and Paris. About 14,000 tons of gypsum are annually raised from these quarries, and are for the most part consumed in that portion of the province, as a dressing for the soil. It is chiefly ground at mills in the neighbourhood, and sold in that state at from fourteen to sixteen shillings sterling the ton. Some of this gypsum is, however, pure and white, and being fitted for use as stucco, commands a higher price. These quarries are situated in the immediate vicinity of railways, which afford facilities for transportation. The gypsum consumed in Lower Canada is chiefly brought from the Magdalen Islands in the Gulf of St. Lawrence. These contain abundant deposits of this mineral, which is brought by water to Quebec and Montreal. The consumption of gypsum for agricultural purposes in Lower Canada is, however, less than in the west, and might be increased with advantage.

*Phosphate of Lime.*—Among the most important discoveries of modern scientific agriculture is that of the value of phosphates as a manure. The beneficial effects of ground bones, and of Peruvian guano, of which last about 200,000 tons are annually brought to Great Britain, are in a great measure due to the phosphates which these manures yield to the soil; and within a few years the use of a soluble phosphate, or superphosphate of lime as an application to the soil, has been so much extended, that its manufacture has become a very important industry in Great Britain, France, Germany, and the United States, and has within the last few years been successfully attempted at Montreal. The phosphates employed for this purpose are bones, certain kinds of guano, and coprolites, the latter a fossil form of phosphate of lime abundant in some parts of England and France. But the supplies of these materials being limited, and the sources in many cases remote, attention has been turned to the deposits of crystalline mineral phosphate of lime (called by mineralogists apatite). This substance is found to some extent in Norway and in Spain, and the investigations of the Geological Survey have shown that it exists in abundance among the Laurentian rocks of Canada, forming veins, which have been met with in several places along the Ottawa, and more abundantly near Perth, upon the line of the Rideau Canal. Here, over an area of many square miles, phosphate of lime has been found in a great number of localities, several of which promise to yield abun-

dant supplies of this mineral. The attention of speculators has been turned to these deposits, which are in a locality favourable for working and for exportation, and during the last year a New York company has expended a large sum of money in opening several veins of the phosphate, with a view to extended mining operations. This mineral phosphate is richer than the coprolites so much used in England, and contains from thirty-five to forty per cent. and more of phosphoric acid. The working of these deposits is, however, undertaken solely with a view to exportation. In order to convert this mineral into superphosphate there is required a large quantity of sulphuric acid, a material which is not manufactured in the country, and can only be imported at a very considerable expense. As yet, the value of the superphosphate as a manure is but little known in this country. Small quantities of it are, however, now manufactured at Montreal, from bones, and the farmers of the country are beginning to learn its importance. It is to be hoped that more enlightened notions of agriculture will soon so much increase the demand for this article as to warrant the establishment of a sulphuric acid manufactory, and the conversion into superphosphate for domestic use of a large portion of the mineral phosphates to be obtained in the province; its employment will be one of the most efficient means of restoring the apparently exhausted wheat lands of Lower Canada.

*Fish Manure.*—A most important and hitherto neglected source of valuable manure is to be found in the great fisheries of the Gulf of St. Lawrence. The use of fish for manure is known in many parts of the world, and there are small and inferior kinds of fish which on the coast of the United States are taken in great quantities expressly for the purpose, and either applied directly to the fields, or converted into a concentrated manure nearly equal in value to Peruvian guano. For this purpose they are cooked by steam, pressed to remove the water, and in the case of some kinds of fish, a large quantity of valuable oil, and finally dried and ground to powder.

According to Payen, an eminent French authority, the total yearly produce of the cod fisheries on the North American coast is not less than 1,500,000 tons of fresh fish. Of this, the head and entrails, equal to one half the entire weight, are left to decay, or are thrown into the sea; but if dried, would yield more than 150,000 tons of a most valuable manure. The French fishermen have for several years had an establishment for this manufacture at Kerpon, on the coast of Newfoundland, and export the product to France. The quantity of manure of this kind which might be manufactured in Canada and the maritime provinces from the refuse of the fisheries, and from inferior kinds of fish which are now neglected, is very great, and this material might become a precious resource both for exportation and for the enriching of our own soils.

*Peat.*—The eastern division of the champaign region of Canada abounds in peat bogs, which are generally distributed, and cover an area approximately estimated at from 120 to 150 square miles. In addition to this the island of Anticosti contains a still greater area. In many of these bogs on the mainland the peat attains a depth of ten to twenty feet, and even more, and, especially in their deeper parts, is often so compact as to sink in water when dried; while it is at the same time very pure, yielding from four to six per cent. of ash. No systematic attempts have hitherto been made to turn this material to use: but within the last few months proper arrangements have been made by an English capitalist to compress, with the aid of proper machinery, the peat of an extensive bog in Bulstrode, on the line of the Arthabaska Railway. The success of this experiment will be a matter of very great importance for Canada. The wanton destruction of the forest in the older settled regions has made fire-wood scarce in a country whose climate renders an abundant supply of fuel indispensable, and which contains no coal mines within its limits.

One of the chief difficulties in the extensive working of peat arises from the obstinacy with which it retains a great amount of water. A large proportion of this must be removed by spontaneous drying, a process to which the Summer climate of Canada is peculiarly favourable. According to Dr. B. H. Paul's late inquiries, it appears that the heat-producing power of good peat is about one half that of the weight of coal. It is claimed that by proper treatment peat can be brought to the same density as coal itself; and Dr. Paul concludes that where such peat can be furnished at four shillings sterling the ton, it may advantageously replace coal at ten shillings, as a fuel for generating steam, burning bricks, &c. The price of coal in our markets is more than twice this, and it remains to be seen whether properly dried and compressed peat can be produced at two-fifths the market price of coal; in which case it may replace it with advantage on our inland steamers and railways, as well as for household use. It is said to have lately been employed with success as a fuel for the locomotives on the New York Central Railway, and it is well known that peat is now largely employed for smelting iron in some parts of Germany. Viewed in the light of the foregoing considerations it can scarcely be doubted that the extensive deposits of peat which Canada contains are destined soon to become very important resources for the province.

**Building Materials.**—Among the materials of first importance to a country are those required for the purposes of building. Of these, besides the wood of the forests, may be mentioned clay for bricks, lime for bricks, lime for mortar and cements, granites, sandstones, limestones, marbles, and roofing slates. The principal sources of these materials in Canada may be briefly noticed.

**Brick Clay** is met with abundantly in almost every part of the great champaign region of Canada, where there are few towns of any size in the vicinity of which bricks are not manufactured. That they are not more generally used for building is due to the fact that quarries of excellent and easily wrought stone are common throughout the province. Through the western division of the champaign country, and in the westernmost parts of the eastern division, as near Brockville, there is found a clay which yields white, yellowish or cream-coloured bricks, which are much esteemed for building, and are carried to Montreal and Quebec. This clay is in many parts overlaid by another, which gives red bricks. From eight to ten millions are yearly made at Toronto, of which perhaps one half are white bricks. These are sold at the kilns at from \$5½ to \$6 the thousand (twenty-two to twenty-four shillings sterling), while the red bricks are worth from \$3 to \$4. At Montreal there are several brick makers, of which the two principal manufacture together about 12,000,000 of red bricks, the ordinary price of which is about \$5 the thousand.

Many of these clays are fit for coarse pottery and for tiles for agricultural draining, both of which are manufactured at numerous places throughout the province; while at Quebec glazed earthenware pipes are extensively made for street and house drains.

**Limestone** fitted for burning is found in great abundance in most parts of the champaign region, as will be seen when we come to speak of building stones. The use of lime as a fertilizer for many soils is well known, and for this purpose the greater part of the limes in the province, on account of their freedom from magnesia, are well fitted. About 270,000 bushels of lime are annually burned at Montreal, where its price is about seventeen cents (eight pence half-penny sterling) the bushel. Limestone is less abundantly distributed in the mountainous districts of Canada, where, however, geological research has shown its presence in very many localities, especially in the Laurentian country, where bands of limestone have already been mentioned as marking the course of numerous fertile valleys. Limestones are also found in many parts of the eastern townships.

The property of forming a mortar which will harden under water, which belongs to hydraulic cements and water-limes, is possessed by the lime yielded by many limestones in the country, as at Quebec, at Hull on the Ottawa, at Thorold near Niagara, and at various other places in the western peninsula. Materials from these sources have been used in the construction of the extensive hydraulic works of the province.

**Building Stones.**—The abundance of good building stones in Canada is so great that it is easier to say where they are not found than to indicate their various localities. Quebec, Montreal, Ottawa and Kingston are built of a grey limestone, which is quarried in their immediate vicinity, and abounds in a great many intermediate localities, from which materials have been obtained for the canals and other public works. The stone required for the great Victoria Bridge at Montreal was in a large part procured from Pointe Claire, a few miles above the city. Limestones and dolomites of superior qualities for building purposes are met with in a great many places in the region to the west of Lake Ontario, which also yields in numerous localities a superior sandstone, of which University College, Toronto, and many other of the public buildings of that city and of Hamilton are constructed. Good sandstones for building purposes are also met with among other places at several points on the Ottawa, at Sillery, near Quebec, and in the more eastern parts of the province.

In the eastern townships, to the east of the Notre Dame range, there are great quantities of granite of a superior quality for building purposes, and in many parts of the Laurentian region, granite, syenite, and syenitic gneiss rocks abound, both red and grey in colour. Some of these materials are equal to the granites of Cornwall and of Aberdeen, and would yield materials for building and for decoration of great beauty and durability, but as they are both more costly to work than the abundant limestones and sandstones, and generally more remote from the great centres of consumption, they are as yet scarcely made use of.

**Marbles.**—The rocks of Canada afford a great variety of marbles. Some of the limestones of the Laurentian region afford a good white marble for building purposes and for tombstones, as at the Calumet, Porfage du Fort, and Fitzroy Harbour, from which last place marble has been obtained for the new Parliament Buildings, at Ottawa. Similar white marbles are also found in Beverley, Elzevir, and Marmora. These marbles are seldom very fine grained, but from the township of Barrie, marbles of a very fine texture, both white and coloured, and variegated, have been obtained, though from the remoteness of the locality they have not yet been wrought. A bluish-grey, veined marble, which, like the preceding, is from the Laurentian region, is quarried near Arnprior on the Ottawa, and another at Grenville, of mingled green and white, containing serpentine, and resembling the Connemara marble of Ireland. Similar marbles abound in many other parts of the Laurentian country, but little has as yet been done to bring these and the other marbles of the country into use.

The hills of the eastern townships afford many marbles of considerable beauty, as at St. Joseph and at Dudawell, the former red veined with white. At the latter place are beds of a cream colour and of grey, veined and mottled with yellow, and sometimes with black. The serpentines of the eastern townships are also many of them of considerable beauty, being generally dark green, often veined with lighter green and white, and resembling in some cases the famous *verd antique*, or some of the serpentines of Corsica and Cornwall. None of these materials which abound in Melbourne, Orford, St. Joseph, and many other parts of this region, have as yet been cut, except for the purpose of exhibition, although the same serpentines are extensively quarried in the neighbouring state of Vermont, and are highly esteemed.

Many of the secondary limestones of the champaign

country of Eastern Canada are susceptible of a good polish, and present pleasing varieties of colour. Good marbles, red, black, and various shades of brown and grey, often agreeably variegated, may be obtained from them in a great many places in the vicinity of Montreal; but are as yet scarcely known, although well suited for internal decoration.

Stones well fitted for flagging and paving are found in places too numerous to mention throughout the province, but brick, and from its cheapness wood, is still to a great extent used for pavements in our towns. Paving-stones are, however, brought from the State of New York and even from Scotland, while materials probably in no way inferior are to be met with in many parts of the country.

Slates for the roofing of houses have until recently been very little used in Canada, but extensive quarries in no way inferior to the best Welsh slates have within the last few years been opened in the eastern townships, on the line of the Grand Trunk Railway. Slates of great size and of excellent quality are here readily obtained. Similar slates are found in several other parts of the same region, and good roofing-slates have also been obtained on the north shore of Lake Superior.

The ores of iron are found in very large quantities in the Laurentian rocks of Canada at several localities on the Ottawa, along the Rideau Canal and in the vicinity of Marmora. These deposits are of the magnetic species, and less frequently, of red hematite, both of which are very rich ores, containing about 70 per cent. of metal. They are similar to those which yield the fine iron of Sweden, and to those which are mined on the shores of Lake Champlain in New York. The absence of mineral coal in Canada would render it necessary to use wood-charcoal for the smelting of these ores, unless, as before suggested, peat be employed for the purpose. The price of labour in most parts of the country so augments the cost of charcoal that the iron smelter here finds it difficult to compete with foreign iron, and to this cause is to be attributed the fact that the ores of Canada are not more extensively worked. The State of Michigan possesses on the southern shore of Lake Superior great deposits of red hematite ore, not unlike those of Canada, and within the last few years has exported large quantities of this ore to the vicinity of the coal mines of western Pennsylvania, where it is smelted. The value of the iron ore thus shipped is said to be at present about \$2,000,000 annually, and the amount is increasing. A similar one has lately been found in Canada, on the north shore of Lake Superior, and is about being mined by an American company for exportation to the United States. It has been attempted to send the rich ores from the Laurentian region of Canada to the American market, and it is probable that the plan may be successful, especially as some of these deposits are very advantageously placed for transportation by water.

Extensive beds of good iron ore occur in the eastern townships. They are iron slates, consisting in a large part of red hematite, and although less rich than the ores already mentioned, might under favourable conditions be smelted with advantage, as has already been the case to a limited extent, the ore having been taken to Vermont.

At various localities in the champaign region of Canada considerable quantities of bog iron ore are found. Near to Three Rivers this ore was smelted for more than a century, and although the ancient furnaces are now abandoned, others have been established near by at Batican, known as the Radnor forges. The fuel here used is charcoal, and the metal produced is highly esteemed not only for castings, but for the manufacture of wrought iron.

Veins of copper ore occur in various places in the Laurentian region, and some of them are now being opened, with what success remains to be seen. On the north-eastern shore of Lake Huron, in the Huronian rocks, extensive veins of rich copper ores have been

mined for several years, and in some instances with great profit, as at the Wellington Mine. The ores of copper are widely disseminated in the eastern townships, for the most part in the form of irregular beds and interstratified masses. The Acton mine was one of these, which in three years yielded ores equal to about 1 000 tons of copper, but is now exhausted. Numerous other attempts have been made to work copper ores in this region, and several millions of dollars have already been invested, chiefly by New York and Boston capitalists, in the purchase of mining lands in this region; but the workings hitherto have not generally proved remunerative, although from the wide diffusion of the metal in the rocks of the district, and from the great richness of the Acton deposits there is reason to expect that some of these mines may become sources of profit. The most extensive mining operations as yet undertaken in the eastern townships are at Harvey's Hill, in Leeds. Several localities in the vicinity of Sherbrooke now give promise of profitable mining.

The mines of native copper on the south side of Lake Superior are well known, and from these the State of Michigan now exports, it is said, about \$7,000 of copper annually, while the produce is increasing. The north or Canadian side exhibits similar rocks, containing in many places deposits of native copper like those of the south side. But although these have been known for the last twenty years, ever since indeed the first opening of the mines on the southern shore, almost nothing has been done to develop them. From the identity of the formations, and from the abundance with which the metal appears to be distributed in this part of the Canadian territory, it can scarcely be doubted that a skillful outlay of capital will yet develop on this northern shore a mining region second only to that of northern Michigan.

Lead ore occurs in many places in the Laurentian region in the form of veins, which also appear in the eastern division of the champaign region, south of the Ottawa. Some of these veins may perhaps be wrought with advantage. Lead ore has also been met with in several localities on the shore of Gaspé, where mining operations have lately been undertaken. Small quantities of the ore have also been found in the eastern townships, and on Lake Superior; in both of these regions the lead is often rich in silver.

*Gold.*—This precious metal has been shown to exist over a large extent of the eastern townships, from near the line of Vermont, in which State gold has been met with in a great many places, as far north-eastward as Quebec, and it may not improbably be found further eastward to Gaspé, along the mountainous belt which stretches to the extremity of the province. It is from the breaking down of the rocks of the Notre Dame range that have been derived the sands, clays, and gravel which make the soil of this belt of hills, and of the region to the east and south of them. Gold has been found in several instances in these rocks, but the attempts hitherto made to work it have been by washing the superficial sand and gravel. These trials have in some parts been successful, and the region is now attracting skilled labour and capital, which may probably meet with profitable returns.

Among the other minerals of Canada which are capable of being turned to use, we may mention some few of the more important.

*Iron Pyrites* is found abundantly both in the Laurentian region and in the Eastern Townships, and is a material of value for the manufacture of coppers, and as a source of sulphur for the fabrication of sulphuric acid, or oil of vitriol. This substance is one of great importance to the manufacturing industry of a country, for it forms the starting point in the ordinary processes for the production of chlorine, bleaching powder, and soda-ash. Of these the latter is the indispensable material for the manufacture of soap and of glass. Sulphuric acid is moreover largely consumed for making superphosphate of lime, and for the refining of petroleum,

two processes having a special interest for the province of Canada, in which the manufacture of sulphuric acid has not yet been attempted.

*Chromium*, in the form of chromic iron ore, is another substance which is found in considerable quantities in several parts of the Eastern Townships, and is valuable as the only source of chromate of potash, which has now an extensive use in the arts for the manufacture of several pigments, and in various processes of dyeing and calico-printing.

*Titanium*, which has within a few years attracted the attention of iron manufacturers for its supposed beneficial influence upon iron, and has moreover been proposed for several other uses in the arts, is found in Canada in great and apparently inexhaustible quantities, as ilmenite or titanite iron ore, both in the Laurentian region and in the Eastern Townships.

Among other materials may be mentioned ores of nickel and cobalt, molybdenum, and carbonate of magnesia, all of which find their applications in a country where chemical manufactures are pursued.

*Ochres* for paints, of great purity, and of various shades of colour are abundant in several parts of Canada, and are extensively wrought for the New York market. In like manner sulphate of barytes, which is largely used in the preparation of pigments, is found in considerable quantities in several parts of the province.

*Quartz* of the purity required for glass-making is abundant in the form of white sandstone in several parts of the province, and is employed in a large glass-factory now in successful operation near Vaudreuil, a few miles west of Montreal.

The various refractory materials required for the construction of furnaces, and for smelting metals are wanting in Canada. In many parts of the Laurentian region *plumbago* or black lead is found of a superior quality for the manufacture of crucibles.

*Soapstone*, which is used not only as lining for furnaces, but in the United States for the construction of stoves for domestic purposes, abounds in the Eastern Townships; while sandstone for the hearths of furnaces, fire-clay, and moulding-sand are found in many parts of the province.

*Mica*, which now finds so many applications in the arts, exists in the Laurentian region of Canada in abundance, and of an excellent quality. Thin sheets of the mineral of very large sizes are obtained, and it is already an article of export.

As materials for millstones, varieties of granite, and of hard quartzite rocks, are made use of in various parts of the province; and in Grenville on the Ottawa a variety of *silex*, precisely resembling the French burr-stone, is found. Grindstones are made in many parts of western Canada from a sandstone well fitted for the purpose, while whetstones and hones, some of them of superior quality, are found in a great many parts of the country.

Superior stones for the purpose of lithography have been found in several localities in western Canada; but although trials have shown them to be of excellent quality, they have not been brought into use.

Among materials for ornamental purposes may be mentioned agates, jaspers, Labrador felspar, and porphyries. In Grenville and in Chatham are found in great abundance, porphyries of fine texture, susceptible of a high polish, and of various colours, rivalling in beauty the porphyries of the old world.

Springs of *petroleum* or mineral oil occur in several localities in the south-western part of Canada; and from several wells sunk in Enniskillen, near Lake St. Clair, several millions of gallons were obtained in 1861-2. Since that time however the supply of oil from the wells has greatly diminished. In other localities in this region, as at Bothwell, the existence of natural springs yielding a little petroleum has led to the sinking of wells, which are yielding moderate supplies of oil. The part of the country here underlain by the oil-bearing rock is very large, and it is not improbable that from some portions

of it considerable quantities of petroleum may yet be obtained.

At the other extremity of the province, in Gaspé, natural springs yielding small amounts of petroleum are found over a considerable area, and wells are being sunk in the hopes of obtaining it in available quantities. The oil in this region occurs in Upper Silurian rocks, while in south-western Canada it belongs to the Lower Devonian limestones. These are supposed to be the source of the wonderfully productive wells of western Pennsylvania and the adjacent regions; the estimated value of whose produce of petroleum for the current year is stated at not less than \$75,000,000. Although the geological conditions have there been more favourable to the preservation and accumulation of the oil than in Canada, it is probable from the results lately obtained in Bothwell, that wells in this region may be made to yield satisfactory returns.

The narrow limits assigned to the writer of this essay, which he has prepared at the request of the Minister of Agriculture, have permitted nothing more than a notice of some of the more important mineral resources of the province; and the reader who may be desirous of farther information upon these subjects, and also of more detailed chemical descriptions and analyses of the soils of the country, is referred to the large 8vo. work published in 1863, which is the source of the information here given.

We can mark in each succeeding Exhibition unmistakable proofs of the rapid progress which Canada is making in the social scale. At the Industrial Exhibitions of London, New York, Paris, and Dublin, those great milestones in the pathway of the world's progress, the word "Canada" is broadly marked. It was one of the lessons taught by the magnificent displays at London and Paris that selection and arrangement are the mainstays of success in displaying the products, natural or artificial, of any district.

Compare the map of settled Canada ten years ago with what it is now; glance at the new townships which have sprung up in the West, North-west, and far East, and it will be seen that a tract of country equal in area to a moderate sized European Kingdom has been in part won from the wilderness and settled—an area nearly as large as the whole peopled part of Canada previously to the last census.

There is the Valley of the Saugeen, and part of the Valley of the Maitland on Lake Huron; the Valley of the Nottawasaga on Georgian Bay; the back country stretching from Lake Simcoe to the Rideau; the Valley of the Upper Ottawa, of the St. Maurice, and other rivers in Lower Canada, and of various tributaries to the Great St. Lawrence on both the North and South side as far as Gaspé.

The natural productions of the country, utilized by industry and art, are increasing in number and quantity. One of the most recent is the petroleum of the West, which promises, as recent discoveries show, to become a very important product. The mines of copper in Lower Canada have only been heard of within the last three or four years, and are already both valuable and promising. Different varieties of timber, that great natural staple of the country, formerly allowed to rot on the ground, or burned to get them out of the way, are now articles of export. Apart from all these considerations is the fact that the population of the country has assumed a stability and steadiness of increase which is astonishing when we survey the condition of the country during and since the memorable year 1857.

In no way, however, may an impartial observer note the true progress of the country more than by witnessing and comparing the Annual Provincial Exhibitions. This is particularly observable in the agricultural department, not on account of greater energy, skill, or enterprise having been given to this branch of our industry, but because it has hitherto occupied much of the capital and attention of the great mass of the people. But the time is rapidly approaching, if it has not already arrived,

in which we shall see a similar progress in arts and manufactures throughout the older settled parts of the country. It would be absurd to look for equal results as far as quantity and variety is concerned, as the colonists are essentially an agricultural people—confining themselves in the field of manufacturing industry to those articles which are most in demand and susceptible of practical application to every day uses, and which cannot be so cheaply produced in other countries. There are numberless items, however, which come, so to speak, from abroad, but which might be manufactured at home. No one requires to be told that the more home industry is encouraged in all its branches, the more prosperous and the more independent is the country likely to become under ordinary circumstances, and many are convinced that it is only necessary to bring Canadian manufactures before the public in a prominent and attractive form, in order to secure, first, attention, and then very general patronage.

## CANADA.

### North West Gallery.

THE contributions sent were collected by the Department of Agriculture, Statistics, and Patents, in less than a month, with the help of the Boards of Agriculture, and the Boards of Arts and Manufactures, of Upper and lower Canada; and the officers of the Geological Commission of Canada.

The grant made by the Legislature was only available for the purpose on the 17th of March, and on the 15th of April thirty-five packages were shipped for Dublin on board the steamship *Nora Scotia*, at Portland, and on the 22nd the remainder of the whole collection (save some packages not delivered in time by the Grand Trunk Railway Company) were despatched on board the *Moravian*.

The sum of five thousand dollars is the amount granted by Parliament for the object of the Dublin Exhibition. Such a grant, although exceedingly generous under the circumstances in which the country is involved, is nevertheless small, when the various expenses connected with such an undertaking are taken into consideration, for nearly all the articles sent have had to be purchased.

NOTE.—Besides the provincial collection sent to Dublin by authority of the Honourable the Minister of Agriculture, a local independent collection has been forwarded by a committee organized in the Eastern Townships at Sherbrooke. The information conveyed to the Bureau of Agriculture is to the effect that it is composed of the following articles:—18 samples of grain of various kinds; 5 samples of maple sugar; 28 specimens of domestic manufactures, cloths, flannels, &c.; maps of the districts of Bedford and St. Francis; a section of a maple tree, with spout, sugar pan, &c.; specimens of flax in straw, in fibre, and flax seed; 44 specimens of as many varieties of wood; 4 specimens of tools; specimens of photography; and 20 specimens of Eastern Townships' copper ore.

### SECTION I.—MINERAL PRODUCTS.

1 THE CROWN LAND DEPARTMENT, *Quebec*.—70 specimens of amethystine quartz, 20 specimens of copper ore, and 30 specimens of native copper.

1A MONTREAL MINING COMPANY. — Specimens of native copper.

2 THE OFFICERS OF THE PROVINCIAL GEOLOGICAL SURVEY, *Montreal*.—A collection of minerals and mineral products from different parts of Canada, viz. :—

#### IRON ORES.

Bog Ore.—Radnor furnaces, *Bathscan*. With specimens of cast and wrought iron made from the ore which is found in many places in the vicinity. St. Vallier, Co. Bellechase. Similar ores abound in Vaudreuil on the Ottawa, and many other places.

Red Hematite.—M'Nab, lot 6, ranges C and D. A bed thirty feet thick on the Ottawa river. Sutton, lot 9, range 11; a bed seven feet thick of iron-slate. Sutton, lot 6, range 9; a bed seven feet thick of iron-slate.

Brome, lot 3, range 1; a bed of five feet. Similar beds of iron-slate are abundant in the townships just named.

Magnetic Ore.—Sutton, lot 9, range 9; a bed twelve feet thick holding the crystallized ore in dolomite. Marmora mine, Belmont, lot 8, range 1; a succession of beds occurs here, one of them 100 feet thick. This ore has been smelted, and is of great purity and very abundant. Newboro, South Crosby, lots 26, 27, range 6; a bed of 200 feet thick, which has been quarried and shipped to Pennsylvania for smelting. It is on the Rideau Canal. Hull, lot 11, range 7; a bed about ninety feet thick, which was at one time, like the last, mined and sent by the Rideau Canal and Lake Ontario to Pittsburg, Pennsylvania. Bathurst, lot 11, range 8. South Sherbrooke, lot 19, range 3. Of these two localities the latter is on Myers' Lake, and is said to be sixty feet in thickness. Madoc, lot 11, range 5. A bed of twenty-five feet, which was at one time quarried for smelting in the neighbourhood.

Titanic Iron Ore or Ilmenite.—St. Urbain, Bay St. Paul. A bed of about ninety feet which contains 48.6 per cent. of titanic acid.

#### LEAD ORE.

Galena.—Indian Cove, Gaspé; Ramsay mine, Ramsay, lot 3, range 6; Landsdowne, lot 3, range 8.

Tudor.—Bedford, lot 19, range 7.

#### COPPER ORES.

Sulphurets of Copper.—Escott, lot 7, range 2; Bruce mines, Lake Huron; Wellington mine, Lake Huron; Upton Mine, Upton, lot 51, range 20; Bissonnette's mine, Upton, lot 49, range 20; Black River mine, St. Flavien; Harvey hill mine, Leeds, lot 18, range 15; Coldspring mine, Melbourne, lot 6, range 2; Sweet's mine, Sutton, lot 8, range 10; Haskell hill mine, Ascott, lot 8, range 8.

Native Copper.—St. Ignace Island, Lake Superior; Michicopoten Island, Lake Superior; Mainse, Lake Superior. Chromic iron ore. Mount Albert, Gaspé; Ham, lot 4, range 2.—Bolton, lot 23, range 6.—Melbourne, lot 22, range 6; Iron pyrites, with cobalt. Elizabethtown, near Brockville. A large bed which contains one two hundredth of cobalt.

#### OTHER MINERALS.

Carbonate of Magnesia.—Sutton, lot 12, range 7. Bolton, lot 17, range 9. This mineral forms in the second locality a bed of great extent.

Phosphate of Lime.—North Elmsley, lot 25, range 8. South Burgess, lot 9, range 5. Similar deposits of this mineral are found in a great many localities in the above named and in adjacent townships.

Soapstone. Sutton, lot 12, range 7. Potstone. Bolton, lot 26, range 2. The two minerals just mentioned, of which the first is a compact tale or steatite, and the second a chlorite, are abundant in many parts of the Eastern Townships.

Mica.—Augmentation of Grenville. North Burgess, lot 17, range 9. Mica of a similar quality is found abundantly in several places in the township just named, and in the adjacent one of South Burgess.

Plumbago.—Pointe du Chêne, Argenteuil. Augmentation of Grenville, lot 3, range 6. Lochaber. This mineral is found in many other localities in the Laurentian region of Canada.

#### BUILDING STONES.

Limestone.—Arnprior, M'Nab, lot 4, range C. Portage du Fort. Pointe Claire. Montreal. Gloucester. The first two of these are from the Laurentian limestones; the others, from the Lower Silurian. The Pointe Claire stone was employed for the piers of the Victoria Bridge, and that from Montreal is the common building stone of the city, while that from Gloucester is largely used at Ottawa.

Dolomite.—Owen Sound. This specimen represents a band of dolomite or magnesian limestone, which is also quarried at Guelph, Rockwood, and many other points in Western Canada, and is extensively used.

**Sandstone.**—Lynn, Elizabethtown. Quin's Point, Petite nation. Georgetown, Esquimaux. The first two of these are from the Potsdam formation. The last is from what is called the Grey-Band, which is quarried in many parts of Western Canada, and greatly esteemed as a building stone at Toronto and Hamilton.

**Labradorite.** Abercrombie. The labradorite rock is abundant in many parts of the Laurentian region, and is well fitted for decoration. Gneiss.—Grenville.

**Syenite.**—Barrow Island, near Gananoque. A red syenite similar to the above occurs also at Grenville, and in other parts of the Laurentian region.

**Granite.**—Barnston. Granite precisely similar to the above is abundant in Barnston, Stanstead, Hereford, and many other points in the Eastern Townships.

#### MARBLES.

Light and dark grey, Arnprior; white, Elzevir; yellowish-white, Grenville; white, St. Armand; dove-grey and white, St. Armand; red and white, St. Joseph; grey and red, Caughnawaga; dove-grey, St. Dominique; brownish-black, Pointe Claire; black, Cornwall; grey, Montreal; cream-coloured and yellow, Dudswell; grey and yellow, Dudswell; yellow and white, Dudswell.

#### SERPENTINES.

Light and dark green.—Melbourne, lot 22, range 6. Brecciated green.—Melbourne, lot 20, range 5. Green and white.—St. Joseph, Beauce. Similar serpentines are also found at Orford and several other places in the Eastern Townships.

#### OTHER STONES.

Roofing slates.—Walton's Quarry, Melbourne, lot 22, range 6. Orford, lot 2, range 5. Tring. Kingsey, lot 4, range 1. Cleveland, lot 6, range 15.

Gypsum.—Oneida, York.

Ochres.—Cap de la Madeleine. Pointe du Lac. The ochres of the latter place are prepared for the New York market. Large deposits of similar ochres are met with at Ste. Anne de Montmorency and elsewhere.

Sulphate of Barytes.—Lanadowne, lot 2, range 7.

Lithographic Stone.—Marinora, lot 7, range 4. Ox-bow Saugeen River.

Jasper Conglomerate.—Bruce Mines, Lake Huron.

Sandstone for Glass.—Williamstown, Beauharnois. Similar material occurs in many other places among the sandstones of the Potsdam formation.

[Owing to the short time allowed for the preparation of this collection it is necessarily incomplete. It will, however, be found to include examples of most of the more important economic mineral products of the Province.]

### SECTION II.—CHEMICAL AND OTHER PRODUCTS.

**3 J. MILLAR, Montreal.**—Concentrated extract of hemlock bark (*Abies Canadensis*) for tanning purposes.

About 80,000 lbs. of this extract were exported in the fall and Winter of 1864, via the River St. Lawrence and Portland, for the English and Scotch markets—shipments having also been made to the United States. Heretofore it was necessary to locate tanneries in the hemlock forests; but, if this "Extract" sustains the character claimed for it, these establishments need not henceforth be confined to any particular locality. The article is brought to market in a solid form; it is said to yield tannin of any required strength; it is claimed that, by using it, three or four stocks a year may be turned out, instead of two under the old regime; while 10 per cent. more weight is given to the leather. The "Extract" is a powerful astringent, and can be used as a mordant in dyeing. This new article of commerce has been patented by this firm; and its claims are being submitted to the true test—experience.

**3A TORONTO LINSEED OIL MILLS, Toronto.**—Linseed oil and cake, with a collection of 12 specimens of colours.

**3B LYMAN, CLARK & Co. Montreal.**—Oils and oil cake.

The quantities of oil, paints, drugs, &c., manufactured in Montreal during the past two years were as follows:

	1864.	1863.
Linseed oil - - - gals.	120,000	80,000
Oil cake - - - tons	1,000	750
Glazier's putty - - - tons	300	250
White and coloured paints tons	120	100
Cut dyewoods - - - brls.	500	1,500
Calcined Plaster of Paris brls.	2,500	4,000
Land plaster, - - - brls.	3,000	4,000
Pure ground spices - - - tons	10	15
Drugs in powder - - - tons	25	30

The paints, dyewoods, drugs, &c., are imported in their crude state. The value of the oil cake exported to Great Britain during 1864 was \$24,085, against \$16,714 in 1863. It appears that, in consequence of the duties levied in the United States, the proprietors of patent medicines now find it profitable to prepare certain articles in Canada for exportation to other countries.

**3C PETHIE & STRONGER, Roslin Glen, Canada West.**—Fifteen specimens of starch.

**3D BOGART, D. Gaspé.**—Petroleum oil.

### SECTION III.—SUBSTANCES USED AS FOOD.

**4 THE BOARD OF AGRICULTURE OF UPPER CANADA, Toronto.**—A collection of specimens of grain and other agricultural products, viz.:—Flax seed, black oats, marrow fat peas, bald club wheat, white Winter wheat, white oats, Morton spring wheat, white bush beans, alsine clover, white oats, Winter rye, oil cake, white marrow-fat peas, red bush beans, blue imperial peas, Champion of England peas, black butter beans, Fife Spring wheat, tares, two rowed barley, six rowed barley, white and yellow Indian corn, yellow Dutton Indian corn, scutched flax, phosphate of lime, early China bush beans, red Winter wheat, case knife beans, Hungarian grass seed, Timothy grass seed, asparagus beans, scoules Winter wheat, golden vine peas, flax straw, tobacco leaf.

**5 THE BOARD OF AGRICULTURE OF LOWER CANADA, Montreal.**—Two collections of specimens of grain and other agricultural products, one in quart glass jars and one in half-bushel barrels, comprising Spring Fife, black sea, and white fall wheat; Spring rye, two rowed and four rowed barley; potato and common oats; early field, common field, marrow-fat and black-eyed peas; red random and white Canadian clover seed, flax seed, Timothy seed, horse, early clime bush, white, yellow, spotted kidney, scarlet running and horticultural running beans; black tares; yellow, white and early sweet Indian corn; buck wheat, maple sugar, tobacco.

**5A McCOLLUM, J. Howard.**—Tobacco leaf and stalks; maple sugar.

### SECTION IV.—VEGETABLE AND ANIMAL SUBSTANCES.

**6 L'ABBÉ BRUNET, Professor of Botany at the Laval University, Quebec.**—A collection of forty-eight large specimens of woods, showing a varnished and polished sheet of veneer fixed on a solid board of the same variety of wood, of which the following is an enumeration:—

**1 White Wood, Tulip Wood.** French, Tulipier. (*Liriodendron tulipifera*, Linn). This wood is extensively used as a substitute for pine, for building and cabinet purposes. It is easily wrought, durable. Called erroneously "Yellow poplar." Price at Quebec, 1s. per cubic foot.

**2 Basswood.** French, Bois blanc, Tilleul. (*Tilia Americana*, Linn.) The wood is soft, close-grained, and not liable to warp or split; much used in cabinet work and furniture, in pianofortes and musical instruments, &c. Cost at Quebec, 7½d. per cubic foot.

**3 Hard Maple.** French, Erable. (*Acer saccharinum*, Linn.) The most ornamental portions of the wood are used in the form of veneers for furniture, picture-frames, &c. The plain timber is used for house carpentry and furniture, carriage and waggons. Price at Quebec, 1s. per cubic foot.

4 Soft Maple. *French*, *Pleine*. (*Acer rubrum*, Linn.) The wood is white and often handsomely curled. It is extensively used in the form of veneers for furniture, &c. This wood is also used by wood engravers in place of Box-wood. Price at Quebec, 1s. per cubic foot.

5 Black Cherry. *French*, *Cerisier noir*. (*Prunus serotina*, Ehrhart.) The timber is compact, fine, close-grained, receives a high polish, and is extensively used in cabinet work. Price at Quebec, 1s. 6d. per cubic foot.

6 White Oak. *French*, *Frene blanc*, *Franc frene*. (*Fraxinus Americana*, Linn.) The timber is much valued for its toughness and elasticity; excellent for works exposed to sudden shocks, as the frames of machines, wheel carriages, agricultural implements. Price at Quebec, 10d. per cubic foot.

7 White Elm. *French*, *Orme blanc*. (*Ulmus Americana*, Linn.) The wood is tough and strong, used for the naves of wheels, and preferred by wheelwrights to the English elm. Price at Quebec, 1s. per cubic foot.

8 Buttonwood. *French*, *Platane*. (*Platanus occidentalis*, Linn.) The wood is softer than beech, very difficult to split. It is sometimes handsomely mottled, used in furniture, chiefly for bedsteads, pianofortes, for screws, presses, &c., also exported for tobacco boxes. Price at Quebec, 1s. 2d. per cubic foot.

9 Black Walnut. *French*, *Noyer noir*. (*Juglans nigra*, Linn.) One of the most valuable woods of our Canadian forests. The wood is compact, strong, and tough, much used for building, for furniture, and in the form of veneers. Price at Quebec, 1s. 8d. per cubic foot.

10 Butternut. *French*, *Noyer tendre*. (*Juglans cinerea*, Linn.) The wood is lighter than the "Black Walnut," and is used in panelling, in ornamental works, and for furniture, &c. Price at Quebec, 10d. per cubic foot.

11 White Oak. *French*, *Chene blanc*. (*Quercus alba*, Linn.) The most valuable of the different varieties of American oaks. The wood is of a great strength and durability, used in ship-building, for staves of casks, railway ties, &c. Price at Quebec, 1s. 6d. per cubic foot.

12 Red Oak. *French*, *Chene rouge*. (*Quercus rubra*, Linn.) The wood makes best casks for oils and molasses, but is too little sought after, on account of the great abundance and greater value of white oak. Price at Quebec, 1s. per cubic foot.

13 American Beech. *French*, *Hetra*. (*Fagus ferruginea*, Ait.) The wood is of a very difficult cleavage, of great compactness and strength, much used for planes and other tools of carpenters, &c., in architecture for in-door work; common bedsteads and furniture, &c.

14 Black Birch. *French*, *Merisier rouge*. (*Betula lenta*, Linn.) The wood is strong, compact, and receives a high polish; much used in furniture; when varnished, resembles the "Honduras Mahogany;" used in frames of ships and parts under water. Price at Quebec, 1s. per cubic foot.

15 White Birch. *French*, *Merisier blanc*. (*Betula excelsa*, Ait.) The wood is of a fine compact texture, tough, but not durable, and is used in turning and furniture.

16 Large Poplar. *French*, *Grand tremble*. (*Populus grandidentata*, Michaux.) The wood is white, soft, and quite durable.

17 White Pine. *French*, *Pin blanc*. (*Pinus Strobus*, Linn.) One of the most valuable trees of our Canadian forest. The wood is soft grained, easily wrought, and durable; used in immense quantities in architecture. Price at Quebec, 7½d. per cubic foot.

18 Red Pine. *French*, *Pin rouge*. (*Pinus resinosa*, Ait.) This tree affords a fine grained, resinous timber, of much strength and durability; it is highly valued in architecture. Price at Quebec, 1s. per cubic foot.

19 Canada Balsam. *French*, *Sapin*. (*Abies balsamea*, Marshall).

20 Hemlock Spruce. *French*, *Prucho*. (*Abies Canadensis*, Michaux.) The timber is soft elastic, of a coarse, loose texture, resists well the effects of moisture, and for this reason is used for railway ties, fences, &c. Price at Quebec, 6d. per cubic foot.

21 White Spruce. *French*, *Epinette blanche*. (*Picea alba*, Linn.) The timber is light, strong, and elastic, though inferior to "White Pine," it is still valuable, used in architecture. Price at Quebec, 6d. per cubic foot.

22 Black Spruce. *French*, *Epinette grise*. (*Picea nigra*, Linn. Var. *grisea*—Brunet). This tree attains a height of 40 to 50 feet. Trunk from 12 to 18 inches in diameter. The timber is light, strong, and elastic, and used in architecture. Price at Quebec, 6d. per cubic foot.

23 Tamarac, American Larch. *French*, *Epinette rouge*. (*Larix Americana*, Michaux.) This wood is considered very valuable, being heavy, strong, and durable; used in ship-building and for railway ties. For knees, bends, garlands, &c., of a ship, no wood is better. Price at Quebec, 9d. per cubic foot.

24 Red Cedar. *French*, *Cedre rouge*. (*Juniperus Virginiana*, Linn.) The wood is fine grained, compact, very light, and durable; used for fences, tubs, and pails, and as cases for drawing pencils.

25 White Cedar. *French*, *Cedre blanc*. (*Thuja occidentalis*, Linn.) It is one of the most durable of our Canadian woods. This wood is light, soft, used in frame work of building, and for the upper timber of ship. Price at Quebec, 9d. per cubic foot.

23 Specimens of Veneers.—2 Black walnut (Bird's eye). 3 Black walnut (Blistered). 2 Black walnut (Shady). 1 Black walnut (Excrecence). 1 Black walnut (Knot). 3 Black walnut (Crotches). 1 Black walnut (Plain). 1 Black walnut (Cloudy). 1 Black walnut (Mottled). Maple (Blistered). Maple (Bird's eye). Maple (Curled). White oak (Crotches). White oak (Excrecence). Ash (Excrecence). Ash (Plain).

7 LYMAN, CLARK, AND CO., Montreal.—Specimens of flaxseed and linseed.

## CLASS B.—MACHINERY.

### SECTION V. (A).—MACHINERY FOR DIRECT USE, AND MACHINERY IN GENERAL.

13 R. MITCHELL, Montreal.—Sollen pumps; valves, &c.

13A Captain K. TULLY, Toronto.—A propeller.—(*In Machinery Court*, No. 880.)

### SECTION V. (C).—CARRIAGES, &c.

8. R. M'KINLEY, St. Catharines, C.W.—Specimens of different parts of carriage making.

### SECTION VI.—MANUFACTURING MACHINES AND TOOLS.

9 THOMAS MOORE, Elbiocke, C.W.—A collection of 36 wooden tool handles.

10 SELIVERY, IREDALE, AND WARD, Toronto.—10 specimens of walnut-tree, boot trees and lasts.

11 G. W. REED, Montreal.—35 specimens of boot-lasts and trees.

### SECTION VIII. (B).—ARMOUR AND ACCOUTREMENTS, &c.

12A W. MARSTON, Toronto.—A rifle with new attachment.

### SECTION IX.—AGRICULTURAL AND HORTICULTURAL IMPLEMENTS.

12 THE BOARD OF AGRICULTURE OF UPPER CANADA, Toronto.—43 specimens of hand tools used in horticultural and agricultural operations, viz.:—Cradle scythe, grass scythe, scythe snath, 2 prong boy's fork, 2 prong steel hay fork, 3 prong steel hay fork, 3 prong steel straw fork, 12 prong steel manure fork, 3 prong steel spading fork, steel manure drag, solid neck cast-steel hoe, solid socket hoe, solid neck turnip hoe, solid neck garden hoe, four teeth weeding hoe, steel garden rake.

A. B. WHITNEY, Outland.—Agricultural implements.

## SECTION X. (A).—PHILOSOPHICAL AND OTHER SPECIAL INSTRUMENTS.

13 CHARLES POTTER, *Toronto*.—An ophthalmoscope.

14 DEPARTMENT OF PUBLIC INSTRUCTION OF UPPER CANADA, *Toronto*.—A collection of philosophical and other school instruments; maps and books; Departmental map of British North America; Tellurion with brass sun; six-inch globe, semi-frame; planetarium, low stand; air pump; Brown's geometrical diagram; Maccallum's chart; box of geometrical solids; frame with samples of merit-cards; three-inch globe; plan of building of "The Educational Department;" natural history obj. lesson "The Squirrel;" one set of "Journal of Education" from 1850 to 1864 inclusive; one set of "Chief Superintendent's Reports."

15 DEPARTMENT OF PUBLIC INSTRUCTION OF LOWER CANADA, *Montreal*.—A series of the "Journal of Education" and "Journal de l'Instruction Publique."

## CLASS C.—TEXTILE FABRICS.

## SECTION XII.—WOOLLEN AND WORSTED.

16 BARBER BROTHERS, *Streetville, C.W.*—Samples of cloths.17 J. G. CRANE, *Ancaster, C.W.*—Blankets and articles of clothing.18 A. ROBERTSON AND CO. *Montreal*.—40 specimens of Canadian tweeds manufactured at Peterborough, C.W.18A SLINGSBY AND KITCHEN, *Canning, Canada W.*—Woollen blankets.19 Mrs. J. MARTIN, *Stanstead*.—Ornamented infant shawl.20 R. MILLER, *Montreal*.—Worked counterpane.

## SECTION XIV.—MANUFACTURES FROM FLAX AND HEMP.

21 J. A. DONALDSON, *Toronto*.—Specimens of prepared flax, cordage, and linen.22 LYMAN, CLARK, AND CO. *Montreal*.—Prepared flax and fibre.

## SECTION XVI.—LEATHER, SKINS, FURS, FEATHERS AND HAIR.

23 U. E. CLARKE, *Toronto*.—One leather trunk.24 ALFRED GREEN, *Hamilton*.—A collection of 7 specimens of brush manufacturing.25 CHARLES BOECKH, *Toronto*.—Seven specimens of brushes.26 SHAW AND CO. *Montreal*.—Specimens of sole leather.

Sole leather is divided into three classes, designated "No. 1," "No. 2," and "No. 3;" and the Act provides that leather ordinarily distinguished among dealers by its comparative weight, shall also be divided into three classes—*heavy*, *middling*, and *light*. Every piece or side of leather under 14lbs. weight, is to be considered *light*; over 14 lbs. and under 20 lbs., *middling*; 20 lbs. and over, *heavy*, or *over-weight*.

27 J. BOYD, *Montreal*.—A collection of brushes.28 J. C. M'LAUREN, *Montreal*.—Fire hose, pipes and couplings.29 DONOVAN, MORAN, AND CO. *Montreal*.—Specimens of leather.30 BROWN AND CHILD, *Montreal*.—A collection of boots and shoes.

There are twelve tanneries in the city of Montreal and vicinity. Extensive business was done in 1864, but profits were not, in most cases, equal to the anticipations of the proprietors. Prices moved steadily downward, and soon became relatively lower than those of the raw material—which has to be procured at least six months prior to its being used. The manufacture of sole leather is becoming concentrated in the hands of men

possessing capital and experience. The production last year was largely in excess of the demand, and a considerable quantity of stock was shipped to Great Britain. The first export of that article from Canada to the British market was in 1863, the value being \$13,000; but in 1864 the quantity shipped was 49,115 sides, valued at \$155,426. A great proportion of the Spanish sole placed in this market goes into immediate consumption in the numerous boot and shoe manufactories in the city, the remainder is taken by dealers in town and country.

The quantities of sole leather inspected during 1864, 1863, and 1862 were:—

	1864	1863	1862
Sides of No. 1.....	120,669	100,040	75,343
Sides of No. 2.....	34,450	30,726	23,042
Sides of No. 3.....	3,353	4,540	2,981
TOTALS.....	164,472	135,306	101,366

The black or curried leather which seeks a market in Montreal is made chiefly at small tanneries scattered throughout Western Canada. Prices have not been remunerative—the supply being in excess of the demand.

The manufacturers in that city, it is believed, produce three-fourths of all the boots and shoes made in Canada; the quantity manufactured in the Kingston Penitentiary is estimated to be about one-eighth of the whole, the remaining one-eighth being the product of the other manufacturers throughout the province. There are seventeen or eighteen manufactories in Montreal, the major part being of comparatively small capacity; of the larger ones, however, several produce from 500 to 1,000 or more pairs daily—a somewhat careful estimate showing that about 6,500 pairs of boots and shoes are finished per diem. But, allowing for stoppages, an average of 35,000 pairs per week throughout the year is perhaps tolerably accurate, or 1,820,000 pairs of all descriptions per annum. The entire annual production of this province may therefore be about 2,426,000 pairs. According to another estimate, the value of the boots and shoes produced in 1863 in Montreal was close upon \$2,000,000. If that be correct, the product of this city alone would be nearly 2,200,000 pairs, while the quantity manufactured in all Canada would be over 2,900,000 pairs. It should be borne in mind that these estimates do not include quantities of boots and shoes manufactured by hand.

The most recent improvements in labour-saving machinery have been introduced into the principal manufactories, and about two hundred different kinds of boots and shoes are produced. There are two hundred sewing machines in use, twenty-two pegging machines, six closing machines, three sole-leather sewing machines, several sole-cutters—besides machinery for lasting, eye-letting, punching, skiving, &c.

## SECTION XVII.—PRINTING, STATIONERY, AND BOOKBINDING.

31 LÉGER BROSSAUD, *Quebec*.—A large and rich collection of bookbinding, including—1 large quarto volume, *Lagace's Chants d'Eglise*, full morocco, relief bound with gold and ivory worked edge.1 folio album, covering *Livernois Historical Photographs*, full morocco, relief bound.8 volumes large 8vo, *Relations des Jésuites*, full morocco relief bound, gold worked edge.2 large 8vo volumes, J. C. Taché's *Le Canada et l'Exposition de Paris*, full morocco bound, gold edge.1 large 8vo volume, *La Revue Canadienne*, full morocco bound, gold edge.

12 volumes 8vo, *Les Soirées Canadiennes*, full calf, gold edge.

4 volumes 8vo, M'Gee's *History of Ireland*, full calf, gold edge.

1 volume 8vo, Bibaud's *Commentaries*, full calf, gold edge.

2 volumes 8vo, Chauveau's *Charles Guérin*, full calf, gold edge.

2 volumes 8vo, Drapeau's *Colonization*, full calf, gold edge.

2 volumes 8vo, *Université Laval*, full calf, gold edge.

2 volumes 8vo, Ferland's *Histoire du Canada*, full calf, gold edge.

1 volume 8vo, *Missions de la Nouvelle France*, full calf, gold edge.

1 volume 8vo, Lemoine's *Maple Leaves*, full calf, gold edge.

2 volumes 8vo, Bréchet's *Mes Loirs*, full calf, gold edge.

3 volumes 8vo, McGee's *Canadian ballads*, full basane, red edge.

1 volume 8vo, Langevin's *Archives de Beauport*, basane, red edge.

1 volume 8vo, Lemoine's *Ornithologie*, basane, red edge.

2 volumes 8vo, Latour's *Annuaire de Ville Marie*, basane, red edge.

1 volume 8vo, *Conseiller du Peuple*, basane, red edge.

1 volume 8vo, Susor's *Exercices d'Infanterie*, basane, red edge.

1 volume 8vo, Morgan's *Celebrated Canadians*, basane, red edge.

1 volume 8vo, De Wart's *Canadian Poets*, basane, red edge.

4 volumes 8vo, J. C. Tache, *Confederation*, basane, red edge.

1 volume 8vo, Etienne Parent's *Etudes*, full bound, basane, red edge.

32 GEORGE E. DESBARATS, Quebec.—A large and rich collection of bookbinding, including

1 volume 4to, *Art Illustration in the International Exhibition*, extra rich fancy binding.

1 folio volume, *Way's Scenery Photographed by Notman*, full morocco, gold edge.

2 volumes 8vo, Garneau's *Histoire du Canada*, full morocco, gold edge.

1 volume 8vo, Drapeau, *Colonization du bas Canada*, full morocco, gold edge.

1 volume 8vo, Casgrain's *Légendes Canadiennes*, full morocco, gold edge.

1 volume 8vo, De Gaspé, *Les Anciens Canadiens*, half bound, morocco, gold edge.

2 volumes 8vo, J. C. Taché, *Le Canada et l'Exposition*, half bound, morocco, gold edge.

1 volume 12mo, Mrs. Leprohon, *Antoinette de Mircourt*, full calf extra, marbled edge.

1 volume 8vo, Lemoine's *Ornithologie du Canada*, full calf, gold edge.

1 volume 8vo, *Les Ursulines de Québec*, full calf, gold edge.

2 volumes 8vo, M'Gee's *History of Ireland*, full calf extra, gold edge.

2 volumes 8vo, J. C. Taché, *L'Union Fédérale*, full calf extra, gold edge.

1 volume 8vo, Casgrain, *Histoire de la mère Marie de l'Incarnation*, full calf extra, gold edge.

2 volumes 8vo, Proveucher, *Flore Canadienne*, full calf extra, marbled edge.

1 volume 12mo, M'Gee's *Canadian Ballads*, half bound calf, red edge.

1 volume 8vo, Lemoine's *Maple Leaves*, half bound calf, gold edge.

1 volume 8vo, De Gaspé, *Canadians of Old*, translated from the French by Mrs. Pennée, full bound calf, red edge.

1 large 8vo volume, *Geology of Canada*, full bound, calf extra, red edge.

1 volume 8vo, *Canadian Pamphlets*, half bound morocco extra, red edge.

2 volumes 8vo, *Le Foyer Canadien*, half bound morocco extra, red edge.

2 volumes 8vo, *La Littérature Canadienne*, half bound morocco extra, red edge.

4 volumes 8vo, *Les Soirées Canadiennes*, half bound calf plain, marbled edge.

33 ROLLO & ADAMS, Toronto.—Five specimens of bookbinding:—*Scadding's Shakespere*; *Edgar's Insolvent Act*; *British American Magazine*, 2 volumes; *Upper Canada Queen's Bench Reports*, and *Taylor's Chancery Orders*.

34 W. C. CHEWETT & Co., Toronto.—Seven specimens of bookbinding:—*Canada Directory*; *Toronto Directory*; 4 volumes of *Journals*; 1 volume, containing *Almanacs* for 5 years, and an assortment of frames for photographs.

35 JOHN LOVELL, Montreal.—A collection of school books, including half a dozen each of Lovell's *General Geography*; *Easy Lessons on Geography*; Sangster's *National Arithmetic*; *Key to National Arithmetic*; Sangster's *Natural Philosophy*, 1st edition; Sangster's *Natural Philosophy*, 2nd edition; *Student's Note Book of Inorganic Chemistry*; Dawson's *Lessons on Scientific Agriculture*, Robertson's *Philosophy of Grammar*; *Student's Guide to English Grammar*; *English Grammar Made Easy*; *Rudiments of Latin Grammar*; *Elements of Elocution*; *Classic Reader*; *British American Reader*; *Outlines of Chronology*; *Elements of Algebra*; *Key to Algebra*; *English Spelling Book*; *Comprehensive System of Book keeping*.

[These different collections of printing and bookbinding have been made the occasion to exhibit the works of the Canadian authors of the day, both French and English. Besides separate books, several Reviews and other periodicals containing papers on literature and science form also part of these collections, the whole being a pretty fair illustration of the way the English and French languages are dealt with in the valley of the St. Lawrence.]

36 BROWN BROTHERS, Toronto.—A collection of stationery.

37 A. BUSTIN, Montreal.—A collection of stationery.

#### SECTION XIX.—EMBROIDERY, FANCY AND INDUSTRIAL WORKS.

38 J. DEWITT, Montreal.—A collection of mits and gloves.

39 OLIVER CÔTÉ, Quebec.—A large collection of mosaic of furs, Indian vestments, Indian moose-deer and porcupine embroidery, and other various fancy works, comprising—1 *Descente-de-lit*, plucked beaver, with embroidery in moose-deer hairs. 2 mosaics of furs, *descentes-de-lit*. 1 set of embroidered seal skin Indian chief capot, cap and leggings. 1 white seal skin embroidered waistcoat. 2 Caribou capot. 1 prairie fox lady's muff. 1 prairie fox gentleman's cap. 1 embroidered hawk Indian chief cap. 1 bear, wolf and dog's sleigh robe. 1 piano stool cover, porcupine quills embroidery. 4 pairs parlour stools, moose-deer hair embroidery. 2 pairs parlour stools, porcupine quill embroidery. 3 ermine portemonnaies. 4 tobacco seal skin pouches. 1 tobacco seal skin pouch, large. 2 porcupine embroidered little cases. 4 bouquet holders, porcupine quill embroidery. 1 Indian fire pouch. 1 pair Indian gaiters. 1 martin fire pouch. 3 feather fans. 4 feather fans, larger. 6 cigar cases embroidered bark. 6 card cases embroidered bark. 3 card cases moose hair, on cloth. 3 cigar cases moose hair, on cloth. 1 portfolio porcupine quills embroidery. 1 portfolio, moose-deer hair embroidery. 5 boxes of bark embroidered with porcupine. 1 box for needles, fancy Indian embroidery. 4 card receiving baskets, moose hair embroidery. 2 card receiving baskets, porcupine quills embroidery. 6 boxes porcupine quills embroidery. 2 watch-holders embroidered. 2 pairs white Caribou embroidered Indian shoes. 4 pairs children's Caribou shoes embroidered. 2 pairs of moose hair embroidered

slippers. 2 pairs of moose hair embroidered small slippers.

40 PAUL TAHOURHENCHÉ (*Point-du-jour*), Indian Huron Chief, *Lorette, near Quebec*.—A collection composed of 2 hunter's tobagans with drawing collars, 4 pairs of snow shoes, 12 pairs of moccasins, 6 ornamented hunting knives and sheaths of caribou skin, 3 pairs of embroidered caribou paws, and eighteen cluster specimens of natural white, blue, yellow, red, purple and green dyed moose deer hairs for fancy Indian embroidery.

## CLASS D.—METALLIC MANUFACTURES.

### SECTION XXI.—EDGE TOOLS, &c.

41 GALT EDGE TOOLS COMPANY, *Galt, C. W.*—A collection of 42 edge tools of various descriptions.

42 J. DAWSON, *Montreal*.—A collection of planes.

### SECTION XXII.—GENERAL HARDWARE.

43 RICE LEWIS AND SON, *Toronto*.—Seven specimens of skates, hinges and saws.

44 THOMAS PECK, *Montreal*.—A collection of nails of various sizes.

### SECTION XXIV.—GLASS.

45 J. M'CAUSLAND, *Toronto*.—Specimens of stained glass, shown in the form of the Canadian arms.

A company for the manufacture of glass was recently established in Montreal; the works are located not far from the city, on the Ottawa River—the name given to the place being "Hudson,"—and business was commenced in 1864. The manufacturing operations have, thus far, been limited to druggist's bottles, telegraph insulators, soda-water bottles, &c., all required for the Montreal trade—the product being about 70 gross per day. It is contemplated that this new enterprise shall include the manufacture of flint-glass ware. The capital at present invested by this company is \$40,000; number of workmen employed, 60. Large quantities of siliceous sand are used in the process of glass-making; it is found pure and in great abundance in close proximity to the works. Soda-ash, in quantity, is also required; besides lime, and cord-wood—about 50 cords per week of the latter having hitherto been used.

## CLASS E.—MISCELLANEOUS MANUFACTURES.

### SECTION XXVI.—FURNITURE, &c.

46 PIERRE ROY, *Quebec*.—A gueridon mosaic of Canadian woods.

47 JAMES & HAY, *Toronto*.—An inlaid table top.

### SECTION XXVIII.—MANUFACTURES FROM ANIMAL AND VEGETABLE SUBSTANCES.

50 NELSON & WOOD, *Montreal*.—A collection of corn brooms, dusters, pails and wash-boards.

51 JEREMIE NOISEUX, *Montreal*.—One dozen of manilla dusters.

### SECTION XXIX.—MISCELLANEOUS MANUFACTURES.

52 HURD & LEIGH, *Toronto*.—Six plates, and six cups and saucers.

53 CHARLES HEISE, *Preston, C. W.*—Samples of waved mouldings.

54 R. MITCHELL & CO. *Montreal*.—Small pumps and valves.

## CLASS F.—FINE ARTS.

### SECTION XXX.—PAINTING, DRAWING, PHOTOGRAPHS, ETC.

55 W. ARMSTRONG, *Toronto*.—A collection of water colour drawings composed of 28 views of the country extending between Canada and Vancouver's Island; portraits of 27 Indian chiefs; 2 large pictures in frames, and 41 stereoscopic views of Lake Superior.

56 R. DUNCANSON, *Montreal*.—Two oil paintings, Land of the Lotus Eaters, and Chaudière Falls near Quebec.

57 J. B. LIVERNOIS, *Quebec*.—A collection of 44 large historical photographs, known under the name of *Album Historique Livernois*.

#### ENUMERATION OF THE PHOTOGRAPHS.

- 1 Manor of Jacques Cartier at Limoilou, near St. Malo.
- 2 The same, view of the interior of the yard walls.
- 3 Voyage of Jacques Cartier—the St. Lawrence.
- 4 The arrival of Jacques Cartier at Quebec.
- 5 Conference between Jacques Cartier and the Stadacona (Quebec) Indians.
- 6 Martyrdom of Jesuit Missionaries by the Indians.
- 7 First Plan of Quebec, 1660.
- 8 First Monastery of the Quebec Ursulines Convent.
- 9 Residence of M. de Champlain at Quebec.
- 10 Defence of Quebec by M. de Frontenac.
- 11 Battle near Lake George.
- 12 Plan of Quebec attacked by the English, 1691.
- 13 Plan of Montreal or Ville-Marie and fortifications, 1758.
- 14 A general view of Quebec from Point-Lévis, 1759.
- 15 A general view of Quebec from St. Charles River, 1759.
- 16 A view of the Cathedral, Jesuits' College and Recollets Friars' Church as seen after the siege, 1759.
- 17 A view of the Ursulines Nunnery, 1759.
- 18 View of the Jesuits' College and Church, 1759.
- 19 View of the Notre-Dame-de-la-Victoire Church, 1759.
- 20 View of the Palais des Intendants, 1759.
- 21 View of the Treasury and ruins of the Cathedral, 1759.
- 22 View of ruins and of the Bishop's Palace in 1759.
- 23 View of the ruins from Mountain Hill, 1759.
- 24 View of the interior of the Jesuits' Church, 1759.
- 25 View of the interior of the Recollets' Church, 1759.
- 26 Plan of the St. Lawrence, Quebec, and operations of the Siege, 1759.
- 27 Plan of Quebec at the time of the Siege, 1759.
- 28 View of the taking of Quebec, 1759.
- 29 Death of Montcalm.
- 30 Death of Wolfe.
- 31 Tadoussac Jesuits' Chapel (still existing).
- 32 Plan of the Battle of Chateauguay.
- 33 Monument of Wolfe and Montcalm, at Quebec.
- 34 View of the Quebec Seminary and Laval University.
- 35 View of the Ste. Foye's Monument, Quebec.
- 36 The Fathers and Theologians of the last Provincial Council of Quebec.
- 37 A view of Quebec, modern, from Point Lévis.
- 38 A view of St. Roch and the valley of St. Charles.
- 39 Winter view of the fall of Montmorency with the sugar loaf cone.
- 40 View of Tadoussac.
- 41 First landing of H. R. H. the Prince of Wales in Canada, at the River Ste. Marguerite, Saguenay.
- 42 The Delegates of the Provinces at the Quebec Confederation Conferences.
- 43 The Codification Commission of Lower Canada.
- 44 Spencer Wood, near Quebec, residence of the Governor General.\*

\* This very interesting collection is cased in a rich binding; it is styled:—*Photographies, Album historique Livernois*, and exposed in Mr. Brousseau's exhibition of Bookbinding (No. 31).

58 WAYS' scenery photographed by NORMAN, *Montreal*. These twelve views are bound in an album, the cover of which forms part of the collection of book-binding of Mr. Desbarats of Quebec (No. 32).

59 THE BOARD OF WORKS, *Quebec*.—A collection of photographs of various public buildings of Canada.

60 ELIASON AND COMPANY, *Quebec*. A collection of photographed landscapes and portraits, viz:—A large framed card, containing the portraits of the Delegates of the Provinces to the Quebec Confederation Convention, held in October, 1864, namely—

#### CANADA DELEGATES.

1 Hon. Sir E. P. TACHÉ, M. L. C., President of the Conference, Receiver-General, and Minister of Militia, and A. D. C. to Her Most Gracious Majesty.

2 Hon. J. A. MACDONALD, M. P. P., Attorney-General, C. W.

3 Hon. GEORGE E. CARTIER, M. P. P., Attorney-General, C. E.

4 Hon. GEORGE BROWN, M. P. P., President of Executive Council.

5 Hon. OLIVER MOWAT, M. P. P., Postmaster-General.

6 Hon. A. T. GALT, M. P. P., Minister of Finance.

7 Hon. J. C. CHAPAIS, M. P. P., Commissioner of Public Works.

8 Hon. H. L. LANGEVIN, M. P. P., Solicitor-General, C. E.

9 Hon. J. COCKBURN, M. P. P., Solicitor-General, C. W.

10 Hon. A. CAMPBELL, M. L. C., Commissioner of Crown Lands.

11 Hon. T. D'ARCY M'GEE, M. P. P., Minister of Agriculture.

12 Hon. WM. M'DOUGALL, M. P. P., Provincial Secretary.

#### NEW BRUNSWICK DELEGATES.

13 Hon. S. L. TILLY, Provincial and Financial Secretary.

14 Hon. W. H. STEVES, M. L. C., Member of the Executive Council.

15 Hon. J. M. JOHNSON, Attorney-General.

16 Hon. E. B. CHANDLER, M. L. C.

17 Lt.-Col. Hon. J. H. GRAY, M. P. P.

18 Hon. C. FISHER, M. P. P.

19 Hon. T. C. MITCHELL, M. P. P.

#### NOVA SCOTIA DELEGATES.

20 Hon. C. TUPPER, Provincial Secretary.

21 Hon. W. A. HENRY, Attorney-General.

22 Hon. J. McCULLY, M. L. C., Leader of the Opposition.

23 Hon. R. B. DICKEY, M. P. P.

24 Hon. A. G. ARCHIBALD, M. P. P.

#### NEWFOUNDLAND DELEGATES.

25 F. B. T. CARTER, Speaker of the Legislative Assembly.

26 Hon. J. A. SHEA, Leader of the Opposition.

#### PRINCE EDWARD'S ISLAND DELEGATES.

27 Col. the Hon. J. H. GRAY, Leader of the Government.

28 Hon. E. PALMER, Attorney-General.

29 Hon. W. H. POPE, Provincial Secretary.

30 Hon. A. A. McDONALD, M. L. C.

31 Hon. G. COLES, M. P. P., Leader of the Opposition.

32 Hon. J. H. HAVILAND, M. P. P.

33 Hon. E. WHELAN, M. P. P.

Twelve large coloured landscape photographs in frames, taken after oil paintings or nature.

1 Montmorency Fall and Cove, Winter Scene.

2 Tandem Sleigh on the Ice between Quebec and Montmorency from (Krieghoff).

3 Race by Wood Sleighs between Quebec and Montmorency. (Krieghoff.)

4 Winter Crossing of the St. Lawrence at Quebec. (Krieghoff.)

5 Winter Camp in the Bush. (Krieghoff.)

6 Running the Toll, Quebec, Winter Scene. (Krieghoff.)

7 Winter Scene, Habitants and Wood Sleigh. (Krieghoff.)

8 Chippewas Returning from Hunting, Summer Scene. (Krieghoff.)

9 Indian descending a Rapid. (Krieghoff.)

10 Autumnal Foliage View on Lake St. Charles. (Krieghoff.)

11 Rideau Falls.

12 View among the Thousand Isles.

The following are 37 Small Coloured Landscape Photographs.

1 Indian Hunter on Snow-shoes. (Krieghoff.)

2 Squaw on Snow-shoes. (Krieghoff.)

3 and 4 Views on Lake St. Charles, showing Autumnal Foliage. (Krieghoff.)

5 Group of Indians with Traineau. (Krieghoff.)

6 Winter Scene. Habitant and Wood Sleigh. (Krieghoff.)

7 Lorette Falls.

8 St. Ann's Falls.

9 Le Portage. (Krieghoff.)

10 Montmorency Falls and Cove. (Krieghoff.)

11 View among Thousand Isles.

12 St. Ann's Rapids.

13 The Indian Pedlar.

14 Winter Camp in Bush. (Krieghoff.)

15 Drawing Wood, Winter Scene. (Krieghoff.)

16 and 17 Running the Toll. (Krieghoff.)

18 Tandem Sleigh Crossing Ice between Quebec and Montmorency. (Krieghoff.)

19 and 20 Chippewas Returned from Hunting. (Krieghoff.)

21 Winter Sunset on Lake St. Charles. (Krieghoff.)

22 St. Féréole Falls. (Krieghoff.)

23 Race by Wood-sleighs between Quebec and Montmorency. (Krieghoff.)

24 Lake Bonhomme. (Krieghoff.)

25 Lake Beauport.

26 The Narrows, Lake St. Charles.

27 Lake St. Charles, Summer Scene.

28 Indian descending a Rapid. (Krieghoff.)

29 Natural Steps.

30 and 31 Falls of Shaouinigan (Krieghoff.)

32 and 33 Summer Scenes. (Krieghoff.)

34 Montmorency Falls, Summer Scene.

35 Rapids above St. Ann's.

36 Niagara.

37 Four-horse Sleigh on Ice, near Montreal. (Krieghoff.)

61 A. HENDERSON, *Montreal*.—23 photographs of Canadian scenery.

62 M. HOLLINGSWORTH, *Toronto*.—46 small photographic views of Toronto in three frames.

63 W. B. BUTLER, *Toronto*.—One map of Upper Canada and one map of Toronto.

64 M. ORR, *Toronto*.—4 specimens of penmanship.

65 JOHN JONES, *Quebec*.—A large and elaborate specimen of card-board artistic cutting.

[NOTE.—The numbers here given are those of the Special Canadian Catalogue, and not those of the Official Catalogue.]

LIST OF ARTICLES SENT FROM SHERBROOKE, EASTERN TOWNSHIPS,  
CANADA EAST, TO THE DUBLIN INTERNATIONAL EXHIBITION OF 1865.

LOCAL COMMITTEE.

Professor MILES, *Chairman*, Lennoxville  
J. G. ROBERTSON, Esq., *Secretary*, Sherbrooke  
R. W. HENNEKER, Esq.  
L. E. MORRIS, Esq., Sherbrooke  
A. G. WOODWARD, Esq., Sherbrooke  
LUKE ROBINSON, Esq., Waterloo  
Right Honourable Lord AYLMER, Melbourne  
C. BROOKS, Esq., Waterville  
Dr. GILBERT, Hatley  
A. P. BALL, Esq., Stanstead  
C. A. BAILEY, Esq., Cookshire, Eaton

1 F. BACON, *Hatley*.—Wheat-seed,  $1\frac{1}{2}$  bushels per acre; produce, 20 b. per acre.

2 ALBERT KNIGHT, M.P.P., *Stanstead*.—Wheat;  $37\frac{1}{2}$  b. per acre, raised after green crops, using superphosphate of lime.

3 J. FLEMING, *Barnston*.—Wheat; 25 b. per acre.

4 JOHN M'INTOSH, *Compton*.—Wheat; 25 to 30 b. per acre. Peas; 35 b. per acre, 40 day's pea.

5 JOHN CONVERS, *Barnston*.—Wheat.

The Inspection of Canadian Grain is regulated by an Act of Parliament, which designates the standards of all cereals. Wheat is described as follows:—

"No. 1 White Winter"—Shall be sound, plump, and free from admixture of other grain.

"No. 2 White Winter"—Shall be sound and good, but less free from other grain than "No. 1."

"No. 1 Red Winter"—Shall be sound, plump, and free from admixture of other grain.

"No. 2 Red Winter"—Shall be sound and good, but less free from other grain than "No. 1."

"Extra Spring"—Shall be sound, plump, and free from admixture of other grain, and weigh not less than 61 lbs per Winchester bushel.

"No. 1 Spring"—Shall be sound, free from admixture of other grain, and weigh not less than 59 lbs. per Winchester bushel, and shall consist of two grades—"No. 1 bright," and "No. 1."

"No. 2 Spring"—Shall be sound, but less free from other grain than No. 1, and its weight shall not be less than 57 lbs. per Winchester bushel.

All unsound, damp, or very dirty wheat, of whatever kind shall be classed "Rejected."

6 J. J. TAYLOR, *Hatley*.—Peas. Beans; 25 b. per acre.

7 SIMON BEAN, *Hatley*.—Peas; large variety, 25 b. per acre. Peas; small variety, 25 b. per acre.

10 AMOS KEZAR, *Hatley*.—Peas; green, 35 b. per acre.

11 J. D. PARKER, *Hatley*.—Beans; 12 b. per acre, grown among corn.

12 H. G. PEIRCE, *Stanstead*.—Beans; 25 b. per acre.

14 JOHN CONVERS, *Barnston*.—Beans; 30 b. per acre.

15 L. B. LAWFORD, *Sherbrooke*.—Oats; 40 b. per acre.

16 JOHN FLEMING, *Barnston*.—Oats; 40 b. per acre.

17 H. G. PEIRCE, *Stanstead*.—Barley; 50 b. per acre.

18 JOHN CONVERS, *Barnston*.—Barley; 40 b. per acre. Maple sugar, 2 lbs. per tree. Indian corn; 65 b. per acre.

19 J. J. TAYLOR, *Hatley*.—Maple sugar, from the sugar maple tree (*Acer saccharinum*); produce,  $2\frac{1}{2}$  lbs. per tree; from March 20 to April 20, 1864.

21 F. BACON, *Hatley*.—Maple sugar.

23 H. W. HUNTING, *Ascot*.—Maple sugar, and sample of sugar tub.

24 J. G. ROBERTSON, *Sherbrooke*.—Wheat flour, Indian corn meal, Buck-wheat flour, Sherbrooke flour mills.

26 C. P. MALLORY, *Ascot*.—Indian corn meal, Huntingville Mills.

[The grades of flour are established by Act of Parliament, and are:—"Superior Extra," "Extra Superfine," "Fancy Superfine," "Superfine," "Superfine No. 2," "Fine," "Fine Middling," and "Ship Stuff," or "Pollards." The superior quality of rye flour is designated "Superfine;" second quality, "Fine." The superior quality of Indian meal or oat meal is designated "First;" second quality, "Second;" and third quality, "Third."]

28 JAMES WARD, *Bury*.—Flax seed.

29 JAMES MAIRS, *Durham*.—Flax seed; 12 b. per acre.

30 H. BACON, *Hatley*.—Grass seed.

32 EDWARD R. DEAN, *Ascot*.—Indian corn.

33 SIMON BEAN, *Hatley*.—Indian corn; trace of heads of Indian corn; Maple sugar.

MANUFACTURES.

34 ADAM LOMAS, *Sherbrooke*.—Samples, cloths, and flannels, Sherbrooke Woollen Mills.

35-44 Mrs. LUCINDA LITTLE, *Hatley*.—Embroidered blanket, 8 dols.; two pair woollen gloves, 50 cents. each; one pair hose, 1 dol. 50 cents.; one pair socks, 75 cents.; specimens woollen yarn, 75 cents.; One pair men's winter gloves, 1 dol. 25 cents.; Piece white flannel, 75 cents.; Piece plaid, 75 cents.; Piece full cloth, 1 dol.—One shawl, 5 dols. 50 cents.

45, 46 Mrs. MARIETTE SHURTLEIFF, *Hatley*.—Piece plaid flannel, 75 cents.; Piece plaid, 75 cents.

47 Mrs. J. GAGE SMITH, *Hatley*.—Piece full cloth, 1 dol. 50 cents.

48 Mrs. JULIA PLUMLEY. —Piece plaid flannel.

49 JAMES WARD, *Bury*.—Specimens cloth, flannel, frocking, coloured yarn, &c.

[The above articles, Nos. 35-49, are exhibited as samples of domestic manufacture, carried on in the families of the eastern townships' farmers; the raw materials being raised on their own farms, and the produce worked up for the supply of their own wants.]

50 Mrs. ROBBINS, *Lennoxville*.—Ornamental foot-stool cover.

51 Mrs. OSEN, *Bury*.—Small specimen of linen yarn and thread.

52 Mrs. J. W. MARTIN, *Stanstead*.—Ornamental opera cape, 50 dols.

53 LOCAL COMMITTEE (*Vide note at end of Catalogue*).—Maps of districts of Bedford and St. Francis, eastern townships.

54 ARTHUR H. WHITCHER, *Sherbrooke*.—Coloured map of township of Ascot, showing mining localities, &c.

56 H. R. MANNING, *Shipton*.—Hemlock bark for tanning; staves for hardware, nail, and molasses casks.

57 LOWE & WILSON, *Sherbrooke*.—Sample of pine door; pair window sash; pair window blinds.

MEM.—These articles are exhibited as samples of those in common use in Canada.

60 MATTHEW HENRY, *Waterville*.—Model of concave sugar boiler (patented March 19, 1860).

No. 1 holds 42 gallons, price \$16

No. 2 holds 37 gallons, price \$14

No. 3 holds 32 gallons, price \$12

THE ALLEGED ADVANTAGES ARE

Rapid evaporation, and not liable to overflow, being 5 to 5½ feet in length, and 2½ feet in breadth, and 7 inches

deep, making about 15 feet of boiling surface, with a flange all round the top, two inches in width, and also another rising two inches to prevent overflowing.

*Great strength, and not liable to crack.* Being round cornered and concave bottomed, there is a decided advantage in this respect over all other boilers which have square corners and flat bottoms.

*No necessity of removing from arch.* Being about 1½ inches lowest in the centre. Sap, syrup, and sugar may be safely dipped from them, thus saving a considerable expense, as well as trouble, to which all other boilers in use are liable.

*Economy in Fuel.* From the large surface exposed to the fire, less than one half the fuel ordinarily used is required.

Two of these boilers (say two of No. 2, or one each of Nos. 1 and 3), will boil easily for 1,000 or 1,200 trees. If not convenient to run sap from holders directly into the boilers, place a board across each boiler, near the centre of the arch, and upon these keep a small tub of sap running slowly, so as not to check the boiling. Keep your buckets, holders, and every vessel used for sap, syrup, or sugar, perfectly clean. Strain your sap before boiling; use no grease about the boilers; use milk for cleansing—and you will be sure of good, clean, white sugar, worth from one to two cents more than ordinary.

**61 ROBERT M'INTOSH, Compton.**—Section of small maple tree (*Acer saccharinum*), with spout, nail, bucket, &c., illustrative of manufacture of maple sugar.

**62 W. E. ISSORSON, chemist and druggist, Sherbrooke.**—Samples of bees' wax, spruce gum, pine gum.

**63 S. J. FOSS, chemist and druggist, Sherbrooke.**—Samples of oil of cedar, Canada balsam, maple syrup.

**64 B. T. MORRIS, Ascot.**—Flax in straw and fibre.

**67 R. W. HENKEL, Sherbrooke.**—Flax in fibre.

**68 JAMES MAIRS, Durham.**—Flax in straw and fibre.

**69 ANGUS & LOGAN, Sherbrooke.**—Manilla wrapping paper, grey ditto, news printing ditto.

**70 D. P. SQUIERS & Co. Sherbrooke.**—Sample straw paper, Manilla and news printing ditto; grey wrapping ditto; common brown ditto.

The quantity of all kinds of paper used in Montreal are very large. There are no manufactories of the article in the city, but there are eleven paper manufactories in Canada, in which there are sixteen machines in use, seven being Foudrinier's patent; the others are commonly called cylinder machines. The estimated quantity of paper of all kinds manufactured in the province is 4,000 tons per annum; about 600 persons are employed directly at the mills, besides a large number indirectly in collecting materials of various kinds throughout the country. There are about 7,000 tons of fibrous materials consumed in the production of the paper above mentioned, chiefly cotton and linen rags, old ropes, waste paper, straw, wood, and grass. It is estimated that 250 tons of bleaching powder are used, 250 tons of soda ash, besides quantities of caustic soda, 200 tons of alum, 250 carboys of sulphuric acid, &c.

The qualities of paper manufactured in Canada are numerous, ranging from the cheapest kind of wrapping paper, up through all the intermediate qualities, to a common but very serviceable writing paper.

The following are the values of the articles mentioned, imported at Montreal:—

	1864	1865
Paper . . .	\$79,705	\$63,231
Paper Hangings .	38,079	20,970
Playing Cards .	7,100	6,131
Stationery . .	88,432	64,908
Rags . . .	25,824	23,116
Totals, \$230,140		\$178,356

**71 Professor MILES, Lennoxville.**—Collection of cabinet specimens of woods, 44 varieties, named—the growth of the Eastern Townships.

1 White pine (*Pinus Strobus*).

2 (2) Balsam fir (*Abies balsamea*).

3 (3) White spruce, single spruce (*Abies alba*).

4 Black double spruce (*Abies nigra*).

6 (2) Tamarac, or American Larch (*Larix Americana*).

7 (2) Cedar or Arbor vitae (*Thuja occidentalis*).

8 White or poplar birch (*Betula populifolia*).

9 Red birch (*Betula nigra*).

10 Paper birch (*Betula papyracea*).

11 Yellow birch (*B. lutea*).

12 White elm (*U. Americana*).

13 (2) Red, or slippery elm (*Ulmus fulva*).

14 (2) Iron wood or lion wood (*Carpinus ostrya*).

15 (2) Red birch (*Fagus pungina*).

16 (3) White oak (*Quercus alba*).

12 (3) White oak (*Prarinus Americanus*).

10 Brown oak (*P. sambucifolia*).

19 Dogwood (*Cornus sericea*).

29 Sugar maple (bird's-eye) (*Acer saccharinum*).

21 do. root (*Acer saccharinum*).

22 White or soft maple (*Acer dasycarpum*).

23 (2) Wild red cherry (*Prunus Pennsylvanica*).

24 (2) Wild black cherry (*P. serotina*).

25 (2) Basswood (*Tilia Americana*).

26 (3) Butter nut (*Juglans cathartica*).

27 Wickaby.

28 Curled walnut Canada.

30 Section of sugar maple, to show the mode of boring and applying the spout.

31 Set of eight photographic pictures, illustrative of Canadian cottages and village residences.

**73 LOCAL COMMITTEE.**—Set of Canadian school text books, Journal of Education for 1863-64, with reports of Superintendent of Education for the years 1855 to 1863 inclusive.

**75 MINING ASSOCIATION, Sherbrooke.**—Specimen roofing slate, from the Walton Slate Quarry, Melbourne, eastern townships.

**76 F. BACON, Hatley.**—Sample of wool, 5 lbs. each sheep; cost of maintenance, 1 dol. 25 cents per head per annum.

**77 ISRAEL BOWEN, Ascot.**—Hops; 1,500 lbs. per acre, worth 17 cents per lb.

**78 Miss CARTER, Lennoxville.**—Artificial flowers.

**79 Mrs. C. O'GRADY, Lennoxville.**—Specimen of work of cones of the country: two frames, cone-work, showing leaves of forest trees in Autumn; 2 flower jars, cone-work; one table-mat, cone-work.

**80 PAUL SIBLEY, Sherbrooke.**—Two grass scythes and three chopping axes.

**82 C. H. FLETCHER, baker and confectioner, Sherbrooke.**—A box each of fancy candy; common do; sugar cookies; seed do.; wine biscuit; sugar crackers; milk biscuit; butter crackers; oyster crackers; soda biscuit; water biscuit; hard biscuit; Boston crackers.

**83 JOHN WOOD, Roxton Falls, Eastern Townships.**—Side of sole leather.

**84 W. J. S. HOLWELL, Map of Danville Village, Shipton, Eastern Townships.**

**85 MINING ASSOCIATION, Sherbrooke, Eastern Townships.**

1 Sample copper ore, from Viger mine, township of Chester; Lot No. 8, range 6; exhibited by A. Michel, Esq., Manager. This property is being vigorously and systematically explored. An adit level, for which the ground is highly favourable, is now being driven to cut the veins at a depth of 125 feet from the surface. This mine is 15 miles distant from Arthabaska Station of the G. T. Railway, by the Craig's Road.

2 Sample copper ore, from Griffith mine, Ascot; Lot No. 3, range 11; John Griffith, Esq., proprietor. Fine specimens of yellow sulphuret of copper in silicious slate rock. This mining location has been comparatively little explored; but judging from the handsome specimens exhibited, it must be of great value. It is situated about six miles from the railway.

3 Sample copper ore, from Clark mine, Ascot; Lot 11, range 7; Eleazer Clark, Esq., and Co. This mine, which has been vigorously worked for upwards of a year by a powerful American Company, may be re-

garded as a highly successful undertaking. The average value of the ore as extracted from the mine may be estimated at  $3\frac{1}{2}$  per cent. Quite recently, crushing and dressing machinery has been put in successful operation. An average of about 60 hands have been employed since April last. It is situated about one mile from the railway, and in the immediate vicinity of Sherbrooke. This mine is under the able management of Captain Richards.

4 Sample copper ore, from Ham mine, Ham; lot 28, range 4; R. W. Heneker, Esq. Here mining operations have been carried on upwards of two years, and a crushing mill, with dressing-house and circular saw mill erected and put in operation, being driven by water power, of which there is an abundant supply on the location. A very large amount of excavation has been done at this mine to prove the nature and extent of the deposit, and several tons of very rich ore have been incidentally obtained. It is situated about 19 miles from the Arthabaska station of the G. T. Railway.

5 Sample copper ore, from Brompton Gore Mine, Brompton; lots 28, 29, range 9; G. J. Robertson, Esq. At this mine several veins have been opened upon, but the work hitherto has been confined to the surface, no regular or extensive mining operations having as yet been instituted. An average sample of the whole rock moved has been assayed by Dr. A. Hayes, of Boston, and found to yield 15 per cent. metallic copper. It is situated six miles from the railway station at Brompton.

7 Sample copper ore, from Sherbrooke Mine, Ascot; lot 12, range 7; Eleazer Clark, Esq. The copper-bearing rocks in Ascot occupy a breadth of  $4\frac{1}{2}$  miles in a band running diagonally through the township in a north-easterly direction, and have produced very valuable mines, of which the present is one of the most important. The work at the mine has hitherto been entirely of a preliminary or exploratory character, and has proved highly satisfactory, one ore bed being eight feet in thickness, while several others are known to exist on the property. Situated only one mile from the railway.

8 Sample copper ore, from Belvedere mine, Ascot; lot 10, range 9; Eleazer Clark, proprietor. Here a few tons of rock have been removed by blasting. Select portions of this gave, when dressed, one-half the weight of ore, which contained one-third of silicious matter and 7.3 per cent. of copper, the remainder being iron and sulphur. The breadth of this bed, which has an eastward dip of about  $30^\circ$ , is not far from six feet, and it is estimated that it will yield two tons of dressed ore, similar to the above to the fathom. Although no mining operations have been commenced here, considerable work has been done, and with the most favourable results. The mine is situated two and a-half miles from the railway. Seventy feet excavation has been made following the dip of the bed, and striking upon very rich ore throughout its thickness. The following is an assay:—Sample, Belvedere Mine. State Assayer's Office, 11 Boylston-street, Boston. Result of assay:—Sample of copper ore marked as in margin, received from E. Clark, Esq., contains 20 per cent. of copper.—A. A. Hayes, M.D., State Assayer.—October 1, 1864.

10 Sample copper ore, from Balrath mine, Melbourne; lot 2, range 4; Right Honourable Lord Aylmer. Eight copper bearing veins have been discovered and traced on this property; and on one of these considerable work has been done. A shaft has been sunk on this vein upwards of 100 feet, and a drift or level about 50 feet. The ore is of the richest character, and there is reason to believe that when a greater depth is obtained it will become persistent. The mine is situated little over one mile from the railway, and is now the property of the Marrington Canada Mining Company, Limited, Office, 47, Dame-street, Dublin.

11 Sample copper ore, from Roxton Mine; Right Honourable Lord Aylmer and some gentlemen of Liver-

pool. This mine is situated in the western half of the 23rd lot of the 3rd range of the Township of Roxton. The band of dolomite has been shown by costeen pits, producing green carbonate, black oxide, yellow sulphuret, and the variegated pyrites, thinly disseminated, mixed with quartz and barytes. Twenty-five fathoms of this dolomite have been opened upon lengthways, from which the ores sold were raised, and principally the foot wall. In the workings there is a shaft sunk five fathoms, which produces good ore. The Roxton Mine is, comparatively speaking, as yet in an undeveloped state; but considering the work done, the copper ore extracted, and the indications the mine presents, it may be said to belong to the most promising class of mines in the district.

12 Sample copper ore, from St. Francis Mine, Cleveland; lot 26, range 12; exhibited by Thomas Mackie, Esq. Near the Balrath Mine, and the same stratification. This mine is now being vigorously worked under the able superintendence of Captain Francis Bennetts. A shaft has been sunk upwards of eighteen fathoms. An audit cuts it transversely at a depth seven fathoms, and at ten fathoms deep levels have been driven on the course of the vein about ten fathoms in total extent. The shaft yields two tons of eight per cent. ore per fathom, and one of the ends now produces an average of one ton and a half per fathom of forty per cent. ore. (The ore from the mine dressed to thirty per cent.) The most extraordinary variety of ores are found in this mine, few of the ores of copper being unrepresented, and native copper also occurring together with specular iron, manganese, &c. It is situated about three miles from the Richmond Station of the G. T. Railway.

13 Sample copper ore, from Eldorado Mine, Ascot; lot 3, range 8; exhibited by W. S. Hunter, Esq., for Capel, Hunter, and Pierce. This deposit has been only very recently discovered, and already bids fair to be one of the most important in this rich mining district. The ore-bearing bed or vein is at least six feet wide, and has been proved to extend at least five-eighths of a mile on the surface. A large proportion of the mass consists of such pure and unmixed ore as the specimens exhibited. This highly promising mining location is only about three-quarters of a mile from the railway.

15 & 16 Magnetic iron ore, Mine, Melbourne, Eastern Townships; lot 6, range 2; exhibited by Thomas Mackie, Esq. Magnet iron ore and vitreous copper ore, from the same location, the former occurring in an extensive bed between quartz ore, sandstone and slate, and the latter in a series of parallel embedded veins, extending over a breadth of 200 feet in chloritic slate. Considerable work has been done in exploring. Three trial shafts have been sunk to considerable depths on the copper-bearing beds, and several costeen have been cut; all exhibiting the great mineral richness of the location. A band charged with vitreous ore gave to the assay of the writer seven per cent. of metallic copper. This mine is about six miles from the railway at Richmond.

21 Magnetic copper, from Marrington Mine, Ascot; lot 6, range 9; Captain Francis Bennetts. This mine was opened upon a thick bed or vein of mundic or bisulphuret of ore, showing only slight traces of copper. It has, however, under the vigorous and judicious management of Captain Bennetts been tested pretty extensively, and has increased in a very marked manner in the yield of copper ore in proportion as the works are carried deeper. This is a most important fact, establishing the value of many veins in this district, which at the surface appear to yield a little copper, though much iron ore. The mining operations have been conducted in a very systematic manner. The principal shaft is now nearly 40 fathoms in depth, the last ten fathoms having produced more or less copper ore, say 8 cwt. of 8 per cent. of ore to the fathom. The total linear extent of the drifts is about 47 fathoms. The vein is now, everywhere, producing good specimens of yellow sulphuret of copper, with every encouragement

to a continued prosecution of the work. The veins in this mine are effected by cross courses of amygdaloid trap and fluccan, or soft decomposed rock, which are always regarded by the miners as highly favourable indications. Situated four miles from the railway at Lennoxville. Belonging to the Marrington Canada Mining Company, Limited, Office, 47, Dame-street, Dublin.

22 Magnetic copper ore, from Ascot mine on Haskill Hill; lot 8, range 8. "The mine was opened on a twist in the stratification, giving three courses of ore in the breadth of 80 feet. The ore obtained from the excavation, without any dressing, was sent to Boston, where it yielded on an average about 8 per cent. of pure copper. The rock of Haskill Hill composes a belt of ridgy land, from Owl's Head to Ham mountain, and spreads out to a width of about seven miles, showing indications of copper near Sherbrooke in several places."—*Extract from Report published in 1862.* Since the above was written, very extensive work has been done on portions of the rich beds of ore on this property. Shafts have been sunk, and all the necessary buildings erected for dressing and storing the ores—comfortable dwellings for workmen, &c., and the whole laid out on a very spirited plan by the owners, Messrs. Galt, Shanley, &c. This mine has every advantage for being worked profitably, having wood and water in abundance, and being near the railway.

26 Magnetic copper ore, from Lake Joseph Mine, Halifax; Lot 7, Range 11; A. G. Woodward, Esq., exhibitor. The location has been only slightly explored, and details unknown. The ore-bearing vein is stated to be three feet wide, and the specimens are certainly very encouraging.

29 Sample gold-bearing quartz, from New Ireland; exhibited by A. G. Woodward, Esq. No analysis of this rock having been produced, we are unable to state whether it contains a workable proportion of gold.

31 Sample chromic iron ore, from Melbourne slate quarry. A vein of this material, which is valuable as the base of many beautiful pigments and dye-stuffs, has been traced in the slate quarry property in Serpentine. The ore is of the very best quality, yielding 53 per cent. sesqui-oxide of chromium, equal to 69.6 per cent. of chromic acid.

32 Sample copper ore, from Carbuncle Hill Mine, Orford; lots 2 and 3, range 15; A. A. Adams and Co. This vein is situated in the centre of that remarkable mineral region in Orford, which has already been described under Nos. 5 and 11. Several small openings have been made, and about twelve tons of 15 per cent. ore extracted. The principal vein, which is a true one, is about five feet in thickness, and shows bunches of extraordinary extent and richness at various points. The property is between eight and nine miles from Brompton station.

(4A) RICKMAN, S. *Liverpool*.—Canadian apatite, containing 90 per cent. phosphate of lime.

(A) Surface sample soapstone (steatite), South Potton, Professor Miles.

(B) Copper ore, from the Williams Mine, Ascot, Colby, Morrill, Ball, and Co.

(C) Map of Township of Ascot, showing mining localities, &c.

NOTE.—The specimens of seeds, articles of domestic manufacture, minerals, &c., enumerated in the foregoing list, were collected in the month of February, under the auspices of a Committee of gentlemen who were anxious to respond to an invitation to procure at least some slight representation of the natural products, &c., of the Eastern Townships of Lower Canada at the Dublin International Exhibition. Owing to the unfavourable

season of the year, as well as the shortness of the notice, and other circumstances unnecessary to mention, it was found impossible to collect any great number or variety of specimens; but the committee made endeavours that what they might collect should present, if not an extensive, at least a fair exemplification of the actual products and condition of this important section of Canada. The accompanying maps, copies of local papers, and educational text books, &c., will serve to assist the inquirer and intending emigrant in forming an opinion of the eligibility of the Eastern Townships of Lower Canada, as an attractive field for the investment of capital in agriculture, manufactures, and mining, and as being the nearest (and in some respects the most eligible) region for a man to establish his home in, after he has made up his mind to emigrate from Great Britain or Ireland, and yet to preserve his allegiance and continue living under the protection of British laws and the glorious old flag.

The names of the Sherbrooke Local Committee are given at the head of this catalogue; any one of them can be applied to for reliable information, or any other assistance that may be required by persons coming out to settle in the country.

## CEYLON.

### North-west Gallery.

1 POWER, E. R. *Swanley, near Dartford, Kent*.—A pair of lyre tables of various woods of Ceylon.

2 SIMMONDS, P. L. 8 *Winchester st. Piccadilly, London, S.W.*—Hide ropes, fibres, oils, basket work, rope of skin of spotted deer (*Azias maculata*); *Roccella tinctoria*; *Nigella sativa*; *Panicum colonum*; cassia bark; fine cinnamon; Cong fruit; lovylevy (*Placourtia inermis*); Jaffna moss (*Plocaria candida*); nutmeg fruit; *Paspalum scrobiculatum*; samples of paddy or unhusked rice; chay root; pine-apple fibre; kittool fibre (*Caryota urens*); coir and yarn; weaver bird's nest; pearl oyster shells; window oyster shell (*Anomia*).

## DOMINICA.

### North-west Gallery.

SIMMONDS, P. L. 8 *Winchester st. S.W., London*.—Collection of woods; curious wooden lock used by the peasantry; carved bracket; calabash rattle; razor strop of agave pith; collection of sticks and supple jacks; flambeau or torch; *Cassia fistula* pods; globe fish; flying fish; nutmegs in arillus; seeds of *Adenanthera pavonina*; Job's tears (*Coix lacryma*); cloves; Cassada meal; bread fruit meal; Mocha coffee from Bonavista; pea berry coffee; cocoa; black pepper; small tortoise-shell articles of native manufacture; ropes of Mahaut cochon, and of palm leaf; crystals of sulphur ore from the Souffriere.

## FALKLAND ISLANDS.

### North Gallery.

FALKLAND ISLANDS COMPANY, *Gracechurch st. London*.—Fur seal skin, unhaired, and dyed for fur; hair seal skin enamelled for patent leather; seal oil, pale and brown; penguin oil, crude and refined; penguin skin; muff of same; sheep's wool; sea leopard's skull.

## INDIAN COLLECTION.

At all the principal Exhibitions the products and manufactures of India have been well represented. The Executive Committee early put themselves in communication with the India Board, and the Secretary of State for India favourably entertained the application, the following being the reply made:—

India Office, London, 22nd August, 1864.

SIR,

In reply to your letter of the 29th ultimo, I am directed to inform you that the Secretary of State for India, in council, has instructed Dr. Forbes Watson, the Reporter on the Products of India at this office, to forward to you, for the use of the Committee of the Dublin International Exhibition, 1865, such articles now in the country as may be available for the purpose, and also to write to India for such specimens of raw produce as may be procurable in time for exhibition.

I am to request that you will place yourself in communication with Dr. Forbes Watson regarding the details to be observed with reference to the collection to be provided through this department.

I am, Sir, your obedient servant,

(Sig.) HERMAN MERIVALE.

The Secretary, Dublin International Exhibition.

Dr. Forbes Watson, with the zeal and energy which characterize his exertions, immediately took steps to have his department well represented, and also sought aid from other contributors, and suggested that application should be made for some of her Majesty's valuable treasures.

India Museum, London, 13th March, 1865.

DEAR SIR,

I have the honour to inform the Committee that I have recently had the opportunity afforded me of looking over the articles of Indian production, at Windsor Castle, with the view of indicating those which, if graciously lent, would prove a most attractive addition to the Indian department of the approaching Exhibition. An official application should now be submitted to her Majesty's consideration, through Col. Sir Thomas Middleton Biddulph, Master Household, Windsor Castle, under whose immediate charge the articles in question are, and to whose courtesy I am indebted for the opportunity above named. I would also suggest that the application be forwarded through Lord Wodehouse.

Yours, very faithfully,

JOHN FORBES WATSON.

C. E. Bagot, Esq., Sec. Ex. Com.

India Museum, London, 14th March, 1864.

MY DEAR SIR,

Referring to the Indian articles which we hope to have from Windsor, I write to say that I shall be happy to make such arrangements with regard to their packing and despatch to Dublin as the authorities there may wish. I should, however, be glad to know if your Committee will undertake to defray the charges connected with the packing and freight of the same, as it appears to me that these should neither fall to Windsor nor come out of the India Office grant for the expenses connected with collection from this.

And with regard to such special protection and attendance as may be required in the Indian department, from the opening of the Exhibition to its close, I would also take this opportunity of submitting that such likewise should be provided by the Committee.

I am, dear Sir, very faithfully yours,

JOHN FORBES WATSON.

C. E. Bagot, Esq., Sec.

DUBLIN INTERNATIONAL EXHIBITION, 1865.

Exhibition Palace, Dublin, April 13th, 1865.

To Col. the Hon. Sir C. B. PHIPPS,  
Windsor Castle.

SIR,

It has been represented to the Executive Committee that the interest of that part of the Indian collection which comprises specimens of gold and silver work would be materially enhanced by the addition of some examples of Indian jewellery from the valuable collection in the Queen's possession.

Her Majesty has already enriched the Indian department by the contribution of a magnificent assortment of arms and other objects. This and other instances of royal favour to the Exhibition encourage the Committee humbly to solicit that her Majesty may be graciously pleased to permit that a selection of Indian jewellery, not being in use, may be lent for exhibition.

Dr. Forbes Watson, Director of the Indian Museum, is prepared to take charge of such objects as may be entrusted to him on behalf of the Committee; and in the selection of them, should his assistance be deemed useful, will place himself entirely at your disposal.

I have the honour to be, Sir,

Your most obedient humble servant,

C. E. BAGOT,

Sec. Executive Committee.

The Indian Department was one of the most representative in the whole building. The varied nature of the products and manufactures, the great intrinsic value and beauty of many, and the admirable grouping and arrangement adopted, rendered this the most instructive and complete of all the national displays. The visitor became so familiarized with the dresses, products, ornaments, manufactures, and national productions of the country, that he found himself transported, like the Prince in the *Arabian Nights*, over Europe and the Desert of Egypt, in the twinkling of an eye, to the land of "bhang" and jewels.

There were cases in this gallery, to examine the entire contents of which, as they should be studied, would have occupied hours.

A large proportion of the most valuable, as well as the most interesting articles of Indian manufacture exhibited were from the royal collection at Windsor Castle, and exhibited by permission of her Majesty the Queen. In the first section of the case which runs along the wall was a variety of matchlocks of Indian manufacture, and very elaborate fire arms they are. The first was a Damascus rifled barrel, the muzzle of which is made to represent a crocodile's head, the eyes of which are of rubies; the breech and nose ends are richly inlaid with gold; the side-plates and bands are of perforated gold, and a piercer is attached to the arm by two massive gold chains. This fire-arm, which belongs to the north-west of India, is of the most beautiful workmanship. The next specimen of this Indian arm, is a matchlock, which, once upon a time was carried by the Rajah of Jyennagpore, and, though highly finished, and elaborately executed, does not appear by any means to be so valuable in ornamentation as the articles above described. It has a plain polished barrel, the stock varnished and painted with lac. The next matchlock, appertaining to Western India, exhibits, in addition to great beauty of workmanship, more constructive skill in the design of the gun. The stock, which is painted white, is richly embellished with gold, flowered pattern, beautifully executed, Damascus barrel; and the butt and muzzle are inlaid with gold. It is so constructed







that by the motion of the trigger the touch-pan cover is displaced and replaced, and by the motion of a smaller trigger a bayonet, which is attached to the muzzle, is projected. The design and finish of this fire-arm are very elaborate and complete. Perhaps for richness of decoration the last matchlock in the case exceeds the other three, rich and elaborate as each of them is. The barrel of this gun is square externally, the stock is decorated with animal figures in relief, whilst the butt and the muzzle are richly inlaid with gold. We next meet with a collection of Indian swords, of all sizes and shapes, in the ornamentation of which the skill and ingenuity of the artizan seem to have been exerted to the utmost. In one, the grooved blade is set with a row of pearls. Emeralds and pearls sparkle on the hilt, which is enriched with fine enamels upon gold. The scabbard is made of black leather richly mounted with gold, exquisitely enamelled and profusely set with emeralds and pearls. The exquisite finish of the fine Persian and Damascus blade, with which these costly weapons of war are provided, is a noticeable feature in connexion with them. There were numbers of swords in this case, each apparently more rich, more highly finished, and more valuable than the one which went before it. The enamelling of the hilts of the several weapons shows to what perfection this art was brought by the workmen who executed it. A beautifully finished weapon is that which is numbered 11A. From the cross-guard, which is designed to represent a griffin's head, there extends for some inches a plate of embossed silver; the guard is richly and most elaborately embossed and chased in gold and silver, and set with rubies. The scabbard for this costly weapon is a fitting one, being of silver, beautifully embossed and chased. Another rare blade is that numbered 14A, the hilt of which is of gold, richly enamelled, and set thickly with "table" diamonds, the cross-guard being set with fine brilliants. The velvet scabbard is richly mounted in gold and enamels, and studded with "table" diamonds. An interesting weapon in this most valuable collection is Tippoo Sultan's own scimitar (16A), which was found with his body at the fall of Seringapatam, in 1799. It is a very business-like weapon, short and broad in the blade, with a mosaic silver hilt, gilt. From Indian swords to Indian daggers is a natural transition; and in this section richness of execution and beauty of design are to be found in the same profusion that characterize the articles already referred to. Gold and silver, and rubies and precious stones of all kinds, are lavished on the hilts and scabbards of these daggers. In looking at them one could hardly say whether the dagger, or the scabbard which is to receive it, is the more valuable, or the more to be admired. The several weapons exhibited are tabulated so as to indicate the particular district of country to which they appertain. Of the arms shown by the Queen we are enabled to give a photograph, through the kind attention of Dr. Forbes Watson. Amongst the articles exhibited in this section is a beautiful dagger and scabbard, elaborately enamelled, and a sword mounted with gold, and inlaid with diamonds, rubies, and pearls, which were presented to Lord Gough, whilst in India, by the Rajah Shere Singh.

We have some specimens of Indian battle-axes of very beautiful workmanship. One of these is remarkable for the exquisite manner in which the blade is wrought. A large cut emerald is set into the back of the axe, the shaft of which is of gold, finely enamelled and set with diamonds, emeralds, and rubies. On the point of the shaft is a valuable emerald, surmounted by eight large pearls. The blade of the axe glitters with diamonds, emeralds, and rubies. There is also exhibited a battle-axe used on state occasions, which, like our state swords, is as much ornamental as it is useless. The spears and arrows display the same beauty of workmanship, and amongst the shields is another relic of Tippoo Sultan, the shield taken from his body at the capture of Seringapatam. A shield of rhinoceros hide, almost trans-

parent, beautifully wrought in silver, is also deserving of notice (36A and 37A).

The suits of armour which are exhibited are interesting specimens of peculiar manufacture. A suit of Persian armour is a very complete attire in which to go to war. It is composed of chain mail of rivetted links, pointed collar of chain mail, of brass and steel links, forming a diamond pattern, lined with crimson velvet, and decorated with coral beads and medallions, struck with Persian characters, and rivetted through links of mail. In the saddlery department we find another memorial of poor Tippoo Sultan, in the shape of a saddle of green velvet, embroidered in gold and coloured silks, which appears to have seen service, being somewhat worn. It was taken with the articles already mentioned, after the fall of Seringapatam. There is a variety of richly embroidered saddle cloths, which are remarkable as much for the taste displayed in the selection of colours as for the beauty of their workmanship. One of them, numbered 50A, displayed an elaborate design of flowers wrought in floss silks, of colours, lined with crimson silk. Nothing could be more finished than the design and execution of the flowers, which are wrought in silks of rare colours.

In the section devoted to embroidered carpets were some beautiful specimens of manufacture. A hookah carpet of purple velvet, with gold and silver embroidery, is about as rich a fabric as could be seen. A very beautiful article is also the carpet taken from the tent of Tippoo Sultan. It is of crimson velvet, with a centre piece of the most elaborate embroidery of exquisite design, and the borders also of rich embroidery. But perhaps the most beautiful specimen of embroidery in the collection is a work on crimson velvet from Benares, embroidered in silver and beetle-wing (No. 53A).

Amongst the articles of vertu in this department was an exquisitely wrought writing-case (No. 79A), the exterior covered with green enamel, inlaid with gold figures, presented to her Majesty the Queen by the Rajah Duleep Singh.

On gazing round, the visitor knew that he was in the Indian department, so many rich surroundings from the eastern land met his eye on all sides. Over head was the large and valuable crimson carpet of Tippoo Saib, which covered an extensive portion of the wall; and on either side of the balustrades were placed large umbrellas of the true oriental model. The walls of the space devoted to the department were hung with valuable carpets and fine specimens of matting. Amongst the former were a carpet and some rugs imported from North-Western India, exhibited by Messrs. Watson, Bontor, and Co., Old Bond-street, London; also a superior woollen carpet from Southern India, and some grass mats from Midnapore and Malabar, illustrating the excellence which has been reached in this branch of manufacture in these districts. Another interesting specimen of carpet manufacture was the very fine carpet, eighteen feet by fifteen feet, which covered a portion of the wall, manufactured by the prisoners in the Central Prison, Lahore, and forwarded for exhibition by Dr. R. Gray, superintendent. It was of a shawl pattern, firm, and close in texture. There were also cloth manufactured from flax, grown in the Punjab, and a hearth-rug wrought by the same artizans. The umbrellas, which raised their many domes high above everything, gave quite an eastern air to this section of the building. There are umbrellas of one dome, three, and five domes, in blue and gold, crimson and gold, and massive rich fringe. Also a punka or fan elaborately embroidered with gold, massive gold fringe and fittings of silver gilt. This was somewhat in advance of our European notions of a "fan," the ornamental stem being about eight feet long, and the dome as large as that of a medium sized umbrella. Prominent amongst the rich articles with which it is surrounded is a square gold worked shawl from Delhi, exhibited by Everington and Graham. This article, the

chaste admixture of rich colours in which, and the exquisite fineness of the texture, have a beautiful effect, was valued at forty-five guineas; it was, however, exceeded in beauty and value by a square gold-worked shawl, manufactured at Delhi, imported and exhibited by Messrs. Farmer and Rogers, Regent street, London, who value it at fifty guineas; and this again was surpassed by a magnificent square gold-worked shawl, valued at 150 guineas, imported and exhibited by the same London house. The three Cashmere shawls of the purest quality (1103-1105), presented by the Maharajah of Cashmere to the Viceroy of India, also attracted much attention. Colonel Meadows Taylor, under whose superintendence, in connexion with Dr. Forbes Watson, the Indian Department, was arranged, exhibited in this section an orange shawl, which was regarded by the best judges in these matters as a very fine specimen of ancient Cashmere manufacture, and considered to be about 140 years old. It wears its age remarkably well, and probably will be still fresh when shawls as yet unmanufactured will be worthless. Colonel Taylor also exhibited some very beautiful embroidered scarfs and neck ties. Amongst the woollen fabrics was to be found a large variety of very valuable articles. A white net dress skirt, embroidered with gold and beetle wings, manufactured at Hyderabad, was a remarkably beautiful specimen of manufacture. A crimson net scarf from Delhi would probably impress one with the belief that nothing more delicately rich could be produced by the hands of man, or by machinery (which does such extraordinary things now-a-days), if there had not been a few feet distant in the same cabinet a crimson net scarf, also from Delhi, embroidered with gold and silver, and so almost all through this marvellous department, each article appeared to be more beautiful or more valuable than the one which had previously been examined. A white muslin head cloth, embroidered richly with gold, was a very beautiful specimen of embroidery, of which work there was a profusion of samples, all executed in the most superior manner. Amongst these was a shawl end, embroidered with gold, and worked with pearls (No. 787). No written description could possibly convey anything like an idea of the gorgeous beauty of this rich fabric, which comes from Triplicane, Madras. Another exquisite specimen of embroidered work was a red velvet cloth, or ornament, embroidered with gold, and set with stones and pearls, which is placed on idols during festivals. There were a variety of richly embroidered chair covers, purses, waist belts, slipper pieces, &c., manufactured at Benares and Madras. A circular gold piece, embroidered on purple velvet at Madras (810), was not exceeded for beauty of design and elaborate work by any article in the collection. There were displayed in one of the cabinets two *gotahars*, or emblems of royalty, a species of chain wrought in gold work and precious stones.

The specimens of carving in wood, ivory, horn, &c., were most interesting. A chair and table carved in Madras, exhibited by Messrs. Strahan and Co., of Dublin, were specimens of a style of workmanship uncommon here. The chair is composed of dark-polished black wood, carved in the most elaborate manner. There were also walking sticks, carved in sandal wood, with gold mountings; four exquisitely carved ivory ornaments of small size, representing natives bearing a palanquin, &c. (1254), exhibited by Miss Humphries, of Dublin; pottery and many specimens of metal-ware inlaid. The jewellery and articles of vertu exhibited in this department were really so numerous that even to enumerate them would occupy a considerable portion of the space devoted to this notice. One of the cabinets enclosed more gold articles than many had ever seen collected together before, most of them being trophies of the Indian campaigns. In the centre of this case was the state chair of Runjeet Singh. This piece of furniture is of massive gold, the cushions being of crimson velvet, richly embroidered with gold. There was also in this cabinet the state palanquin presented to the Queen by

his Highness the Maharajah of Mysore, in 1862 (97A). It is elaborately ornamented with carved work, gilt and painted; the carpet and cushions are of purple velvet and silk, richly embroidered with gold. Massive gold tassels depend from it, and the fittings are of gold and silver gilt. Tippoo Saib's gold-headed walking stick, a magnificent piece of workmanship. Here also was a walking stick or cane, with massive gold top enclosing a valuable watch, writing implements, and snuff box, ferule of embossed gold, with compartments for holding money. The collection of bracelets, necklaces, ear-rings, anklets set with diamonds, pearls, and emeralds was positively dazzling. There were several Indian drums and musical instruments of curious manufacture. Field Marshal Lord Gough exhibited a beautiful model in silver of the "Kootab Minar," in Delhi; also a model in marble and mosaic of the sarcophagus of Noor Mahal, wife of Shah Jehan, Emperor of Delhi, from the original at Agra.

The collection of raw materials, although small was well selected and described, and embraced types of the most important products.

It is well known that in tropical regions the soil is impregnated with nitrates. The nitrates being produced by the decomposition of organic matters and atmospheric oxygen condensed within its pores. The oxygen in this concentrated or condensed form, readily reacts upon the nitrogen of the organic matter, and gives rise to nitric acid. Bengal supplies the largest portion of the important salt, nitrate of potash, that is used in the European market. The Punjab is said to possess large resources in this respect, which have still to be developed. *Khai jahkhai*, as the nitre is called, was exhibited under various forms. The black specimens are obtained by a process of solution and crude filtration of the efflorescence which is found on old mud walls. The white product is the same salt more carefully prepared. The greater part comes from the hill tracts at the base of cow houses, and is the result of the oxidation of the ammonia thrown off from the urine of the cattle. Neither of the above kinds is manufactured extensively; but the bulk of the native gunpowder used for shooting and for fireworks is procured from this source. The total amount of nitre exported to the whole world from India in one year, seems to average about 29,000 tons, equal to about £661,772; more than half of this is consumed in the United Kingdom. The Indian sal-ammoniac is said to be manufactured from the contents of cesspools, and is chiefly used locally for tinning purposes and making frigorific mixtures. The sulphate of iron, or green vitriol, is dug out of the ground in large masses, and is probably an oxidation product of iron pyrites (sulphide of iron). The carbonate of soda shown was also procured from efflorescence.

Bhang, betel-nuts, opium, and tobacco, were all shown, and may be looked upon as the four most important narcotics, if we except alcohol, in the world. The first two are little known to Europeans; but the betel nuts are second to none in the number of their admirers. Professor Johnston calculates that they are chewed by at least fifty millions of the human race. The mouths of the natives of Ceylon are permanently stained red from the constant chewing of these nuts. The Areca palm, which supplies the betel nut, is known by the Malay name of *Pinang*—whence the name of the island of Penang—which is the chief emporium of the trade. There are various kinds in use, and the modes of preparation differ. The three ingredients used in chewing the nut are, the leaf of the betel pepper in which the nut is rolled, the sliced nut, and *chunam*, or powdered lime, which is smeared over the leaf. As regards tobacco, it is not generally known that £30,000 worth of Indian grown tobacco is annually exported from that country chiefly to Arabia and the Persian gulf, England, and America.

The manufacture of opium is one of the staple trades of India, £10,000,000 worth being annually exported

to China, Pegu, and New South Wales. This opium rarely finds its way into Europe. *Cannabis sativa*, or Indian hemp, is a well-known medicinal plant. It was shown in the Indian collection as a narcotic, being used for this purpose by the natives. The resinous juice in tropical countries concretes on the leaves. This constitutes the base of all the hemp preparations. *Churru* is collected during the hot season by men clad in leathern dresses who run through the hemp fields, brushing through the plants with great violence. The resin adheres to the leather, and is subsequently scraped off and kneaded into balls. The *momra* is a finer kind, and is called waxen *churru*. It is collected by hand in Nepal, and sells for nearly double the price of the ordinary kind. Dr. McKinnon says that in Nepal the leather is dispensed with, and the resin is collected on the skin of native coolies. The *churru* of Herat is considered the most powerful of all the varieties of this drug. *Gunjah* is said to be a substitute, but not the true *Cannabis indica*. *Hachish* is a drug of hemp sold in paste.

The collection of oils was very usefully arranged, the specimens being placed in immediate contact with the seeds or other substances from which they are procured. Large quantities of linseed and rapeseed are annually exported from India to the British markets; but many of the Indian oil seeds are not so well known. Ben oil, extracted from *Moringa pterosperma*, is said to be a valuable oil, because it does not turn rancid; the tree is very common through India. The oil is seldom extracted, and does not form an article of any considerable export. The flowers, foliage, and fruit, are eaten by the natives. Poppy seeds yield by expression about fifty per cent. of a bland and very valuable oil, well known to British commerce. This oil is of a pale golden colour, fluid to within 10° of the freezing point of water. It dries easily, is inodorous, or of an agreeable odour, and partially soluble in alcohol. It is perfectly bleached by exposure to the sun. Mr. Bingham makes the following remarks upon this valuable oil:—"The poppy seeds have no narcotic qualities, but have a sweet taste, and are used parched by the lower class of natives as food. It is also much used by sweetmeat makers. This, the seeds of the teal and cocoa-nut, are the only oil seeds used for this purpose. It produces, under the native method, a clear limpid oil, which burns very quickly. About 50 per cent. of the oil is generally extracted, and the cake is then sold to the poor as food."

Ramtil seed (*Guizotia oleifera*) yields also a sweet-tasted edible oil, plentiful in India, and employed similarly to sesame or gingelly oil; it is not, however, considered so good. The seed which is exported under the name of niger seed yields about 34 per cent. of oil. It was first shipped to London experimentally in 1861. The well-known sesame or gingelly oil (*Sesamum orientale*) is largely employed by the natives of India.

The black-seeded variety or *Tille*, as it is called, affords a larger per centage of oil than the red-seeded kind. Sesame seed has of late been largely exported to France, where it is said to be employed for mixing with olive oil. Three varieties of sesame seed are cultivated in India—the white-seed (suffid-til), the red or parti-coloured (kala-til), and the black variety (tille). It is the latter which affords the greater proportion of the gingelly oil of commerce.

Castor-oil seeds are extensively grown all over India; but improvement in the extraction of the oil is wanted. A mild edible oil is obtained by expression from the cucumber seeds; it is not exported, and is manufactured for native use only.

Cashew nuts (*Anacardium occidentale*) yield a light and sweet-tasted oil, which is affirmed to be equal, if not superior, as an edible oil, to that of the olive or almond. The kernels have lately been met with in English commerce under the name of cassia seeds, an evident corruption of cashew. The nuts are largely employed as a table fruit. Ground-nut oil (*Arachis hypogaea*) is said also to equal olive oil for ordinary purposes.

Piney tallow, from the *Vateria indica*, was also shown. This butter is of a solid consistence, and requires a higher temperature to melt than animal tallow.

Most of the oils in India are expressed. They are worked by the native presses called *kolhor*, which is turned by bullocks. We may cite, as an exception to this statement, castor oil, which is always extracted by boiling in water, and afterwards skimming.

Tamarisk galls (*Tamarix indica*) were shown; they are sometimes, but not often, imported to England.

The far famed henna (*Lawsonia alba*) was shown. The leaves of this plant, beaten up into a soft mass with congee rice water, are applied to the nails, finger ends, palms, and soles of the feet over night; on being washed the next morning, these parts are found stained a deep red colour. The men use it to stain their moustaches and beards, and for dyeing the manes and tails of their horses. It is used also as an ordinary dye-stuff. The leaves are used in lepra, and the flowers, when distilled, as a perfume.

The value of the Indian collection shown has been roughly estimated by Col. Meadows Taylor at between £65,000 to £70,000. The sword (14A), the hilt, cross-guard, and scabbard of which were richly studded with table diamonds, is valued at Windsor, under authority, at £45,000; and there were several other of these royal swords, including that of Lord Gough, set with diamonds and precious stones, besides the gold state chair of Runjeet Singh.

## INDIA.

### North Gallery.

#### ARTICLES OF INDIAN MANUFACTURE FROM THE ROYAL COLLECTION AT WINDSOR CASTLE, EXHIBITED BY PERMISSION OF HER MAJESTY THE QUEEN.

1A Matchlock (*Bundook*) N.W. India.—Fine Damascus barrel, rifled; breech and nose ends richly "kooft," or inlaid with gold; muzzle, a crocodile's head, with eyes of rubies; side-plates and bands of perforated gold; piercer attached by two gold chains.

2A Matchlock (*Bundook*) Boondi, Rajpootana.—Stock painted with lac and varnished; plain polished barrel. Formerly the property of the Rajah of Jyena-gore.

3A Matchlock (*Bundook*) Western India.—Stock painted white, with gold flowered pattern; Damascus barrel; butt and muzzle inlaid with gold; touch-pan cover displaced and replaced by motion of trigger; bayonet attached to muzzle projected by action of a smaller trigger.

4A Matchlock (*Bundook*), Western India.—Stock decorated with animal figures in relief; barrel square externally; butt and muzzle inlaid with gold; bands of silver wire.

#### SWORDS.

5A Sword (*Tulwar*), Western India.—Blade grooved, and set with a row of pearls; hilt enriched with fine enamels upon gold, and set with emeralds and pearls; scabbard of black leather, with mountings of gold, richly enamelled and set with emeralds and pearls; waist-belt with buckle also beautifully enamelled, and set with emeralds and pearls; small ivory-handled knife, sheathed in outer side of scabbard.

6A Sword (*Tulwar*).—Persian blade; hilt of ivory, mounted with gold and enamel, in the form of ram's heads; scabbard, black leather, mounted with gold and enamel; belt of gold lace, with gold buckles.

7A Sword (*Tulwar*), Persian.—Fine Damascus blade; hilt and cross-guard finely enamelled with blue and green flowers; black scabbard, embossed, with gilt metal mounts enamelled with blue and green flowers; sword belt of blue velvet, embroidered with gold wire; buckles enamelled *en suite*.

**8A Sword (Tulwar), Khorassan.**—Bladewater-marked; grip, white on one side, black on the other; silver cap, enamelled in blue and gold flowered pattern; gold lace tassel and string of pearls, &c., attached to hilt; cross-guard of silver, enamelled with flowers of blue and gold; scabbard embossed, and ornamented with gilt work; chape of silver, and studs and clasps enamelled as above; leather belt, blue, embroidered with gold.

**9A Sword, Persian.**—Plain ringing blade; cross-guard inlaid with gold; cap of gold, richly enamelled and set with three emeralds; scabbard, black leather, embossed, and mounted with fine enamels in gold; strap of tablets similarly enamelled.

**10A Sword, Persian.**—Damascus blade; small grip; hilt beautifully enamelled on silver; scabbard, crimson velvet, mounted with fine enamels; belt of gold lace, and buckles of silver and enamels.

**11A Sword, Travancore, S. India.**—Blade polished, with plate of embossed silver extending three inches down from guard; hilt, grip, and cross-guard of griffin's head design, elaborately embossed and chased in gold and silver, and set with rubies; scabbard of silver, elegantly chased and embossed throughout.

**12A Sword.**—Damascus blade, water-marked; hilt and cross guard of gold, richly enamelled and set with diamonds; pommel of hilt formed by head of parrot, enamelled with eyes of rubies; scabbard, leather, embossed and gilt; belt, gold lace with mountings of gold and enamels; clasp of waist-belt also enamelled, with fine rose diamond in centre.

**13A Sword, Pertabgurb.**—Bright blade; hilt of enamel, inlaid with gold; pommel, cross-guard, and guard of tiger's head design in gold and set with rubies; scabbard of gold perforated and chased, with mountings of fine enamels in colours.

**14A Sword.**—Very fine Khorassan blade, black watered steel; hilt of gold, richly enamelled and thickly set with "table" diamonds; cross-guard set with fine brilliants; scabbard of velvet, mounted in gold and enamels, and studded with "table" diamonds.

**15A Sword.**—Fine Khorassan ringing blade; hilt of white jade, set with emeralds and rubies; scabbard of arabesque design in chased silver, and studded with rubies and emeralds of large size.

**16A Sword.**—Blade short, broad, and of schimitar shape; hilt of massive silver gilt; tiger's head pommel and cross-guard; scabbard, massive silver gilt; chased throughout. This weapon was taken from the body of Tipoo Sultan, at the fall of Seringapatam, A.D. 1799.

**17A Sword (Pattah).**—Gauntlet sword; blade, plain, polished; gauntlet gilt and set with precious stones; front face of gauntlet of elephant's head design.

**18A Sword (Bhotanese).**—Grip covered with shark's skin, with silver gilt mounts; scabbard of leather, mounted with silver richly chased.

#### DAGGERS.

**19A Kora, Nepal.**—Burnished blade; hilt of wrought design, gilt; scabbard, crimson velvet, mounted with richly chased gold work.

**20A Dagger (Kunja), Nepal.**—Damascus blade, double-edged; hilt of agate and jasper; scabbard, green velvet mounted in gold finely chased.

**26A Dagger (Kunja), Nepal.**—Damascus blade, double-edged; hilt of jade, finely carved in foliage design; scabbard covered with red silk, with chased and gilt mounts.

**22A Dagger (Peishkubz), Lahore.**—Damascus blade, double-edged; hilt and guard carved in jade; scabbard covered with crimson velvet, and mounted in jade, with inlaid flowers of lapis lazuli.

**23A Dagger (Peishkubz), Lahore.**—Damascus blade; hilt of ivory, to which is appended a tassel of pearls; scabbard of gold, beautifully enamelled in colours.

**24A Dagger (Kunja), N.W. India.**—Bright steel blade, carved and double-edged; grip of jade—form, a horse's head, with bridle of gold, inlaid, and eyes of

rubies; scabbard, red leather, with mounts of embossed gold.

**25A Dagger (Bichwa), Kutch.**—Double-bladed, curved; guard engraved and gilt.

**26A Dagger (Bichwa), Kutch.**—Double-bladed, curved; guard engraved and gilt.

**27A Dagger (Peishkubz), Central India.**—Damascus blade; hilt of silver, with birds, flowers, &c., engraved, and inlaid with enamels; scabbard with mounts of silver, similarly engraved and enamelled.

**28A Dagger, Hyderabad, Deccan.**—Plain blade, polished, deeply curved; hilt of horn, mounted with gold and medallions; scabbard of crimson leather on one side, the reverse being of silver, richly chased and embossed.

**29A Dagger, Malabar.**—Blade elaborately mounted with chased silver, hilt finely carved in horn, with silver mounts; scabbard also of horn, mounted in silver.

**30A Battle-axe (Tubbur), Scinde.**—Blade finely wrought and perforated, and studded with diamonds, emeralds, rubies, &c.; the back of axe containing a large cut emerald; shaft of gold, finely enamelled and set with diamonds, emeralds, and rubies; point of shaft set with fine emerald, surrounded by eight large pearls.

**31A Battle-axe (Tubbur),** used on State occasions.—Blade finely wrought and engraved, leaf and cone design; border pattern of inlaid gold; spiral shaft of silver.

#### SPEARS.

**32A Spear, Kutch.**—Mountings of metal, embossed and gilt.

**33A Spear, Central India.**—Shaft covered with velvet, studded with gold-headed nails; spear-head of fine steel; octagonal base, &c., inlaid with silver.

**34A Bow** (painted in colours), with twelve arrows.—Punjab.

**35A Quiver,** containing twelve arrows with steel points.

**36A Shield,** of rhinoceros hide, semi-transparent; bosses of silver.—Southern India.

**37A Shield** taken from the body of Tipoo Sultan, at the capture of Seringapatam, A.D. 1799.

#### ARMOUR.

**38A, 39A, 40A Suit of armour, Persian,** comprising helmet, with hood of chain mail, nasal piece, inlaid with gold ("koof"), in Persian characters. Coat of chain mail of riveted links; pointed collar of chain mail, of brass and steel links, forming a diamond pattern, lined with crimson velvet, and decorated with coral beads and silver medallions struck with Persian characters, and riveted through links of mail.

**41A Coat of chain mail;** links of steel, finely embossed and riveted; edged with rings of brass.

**42A Helmet,** with hood of chain mail; nasal piece inlaid with gold, in native characters.

**43A Suit of armour,** comprising helmet, four cuirass plates, pair of gauntlets, and shield, of Arabesque design, in gilt on steel.

**44A Coat of green velvet,** padded and studded with gold-headed nails, forming figured design; breast piece and topoe en suite.—Bengal.

#### SADDLERY.

**45A Saddle of green velvet,** embroidered in gold and coloured silks; pommel, &c., of embossed silver. Formerly the property of Tipoo Sultan, and taken at the capture of Seringapatam, 1799.

**46A Saddle-cloth,** crimson velvet, richly embroidered with gold and silver thread, and edged with gold fringe.—Madras.

**47A Saddle-cloth,** elaborately embroidered in gold and colours on black velvet.

**48A Saddle-cloth,** of gold embroidery, with borders of silver embroidery, lined with blue silk.

**49A Saddle-cloth,** crimson cloth, covered with embossed silver ornaments.

50A Saddle-cloth, square, elaborate design of flowers, &c., in relief, wrought in floss silks of colours, lined with crimson silk.

#### EMBROIDERED CARPETS, ETC.

51A Hookah carpet of purple velvet, richly embroidered with gold and silver; cover, for hookah stem and mouth-piece, of crimson silk gauze, with silver stripes; ends embroidered with gold and silver.—Moorshedabad.

52A Large carpet from the tent of Tippoo Sultan, of crimson velvet; centre-piece and borders of elaborate embroidery. Taken at the fall of Seringapatam, 1799.

53A Embroidery in silver and beetle-wing and crimson velvet, as a decoration for the throne of a native rajah.

54A Cumberbund (waist-band or scarf), of figured silk, with gold worked ends.—Scinde.

#### UMBRELLAS, FANS, ETC.

55A Umbrella, richly embroidered in gold, with massive gold fringe.—Mysore.

56A Umbrella, crimson, blue, and gold; glass introduced into ornamental design.—Siam.

57A, 58A Two umbrellas, with series of three domes on each handle or stem; green and gold pattern.

59A Umbrella, with series of three domes on one.

60A, 61A Two umbrellas, with series of five domes on each handle or stem; crimson and gold pattern.

62A Fan, or *Punkah*, elaborately embroidered with gold; massive gold fringe fittings of silver gilt.—Mysore.

63A Small hand fan, richly embroidered with pearls and beads; silver handle.—Delhi.

64A, 65A Pair of chowrees of peacock's feathers, set in a handle carved to represent the body of the bird.—Nepal.

66A, 67A Pair of chowrees; handle of carved ivory, mounted with gold and pearls; the whisp of thin strips of ivory.

#### METAL WARE, INLAID, ETC.

68A Hookah, of silver, and apparatus complete, ornamented with flowers in blue and green enamels.

A set of six vessels in embossed silver, with blue and green enamels, from Lahore.

69A Large water vessel or tea-pot. 70A Goblet, with cover attached to silver chain. 71A Vessel, with spout and cover. 72A Drinkingcup, 73A Plate, with cover. 74A Spittoon, with perforated silver top attached to massive silver chain.

75A Large silver vase; base engraved and perforated; edge of basin richly embossed and gilt.

76A Vase, with tripod stand and cover of metal, inlaid with silver (bidri work).

77A Vase, of metal, inlaid with silver (bidri work).

78A Spittoon, with perforated cover of metal, inlaid with silver (bidri work).—All Hyderabad, Deccan.

79A Writing case, with three small inner boxes; exterior formed of tablets of green enamel, with figures in gold.—Pertabgurh.

80A Lota, in black glazed pottery.—Patna.

81A Lota, in black ware, ribbed design.—Patna.

82A Lota, painted in colours.—Kotah.

83A Vase and cover, black ware, with rudely shaped figures in relief.—Bengal. 84A Flower vase, carved in cross agate.—Cambay, Guzerat.

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born.—Rutnagherry. 91A Horn of buffalo, engraved, and end carved to resemble a reclining elephant.—Madras.

#### MATS, ETC.

92A Mat of fine texture, coloured borders and ends.—Midnapore.

93A Mat of *Cyperus tegetum*, black and white.—Cochin.

94A Mat of *Cyperus tegetum*, red, white, black, and yellow.—Cochin.

95A One piece of cloth, cotton and fibre interwoven.

96A One piece of fibrous cloth, fringed, red and blue spots.

97A State palanquin, elaborately ornamented with carved work, gilt, and painted cover, carpet, and cushions of rich gold embroidery on velvet and silk;

massive gold tassels; ornaments and fittings of gold and silver gilt. Presented to her Majesty the Queen by H.H. the Maharajah of Mysore, 1862.

98A Collar and Badge of the Order of the Star of India.

99A Collar and Badge of the Order of the Star of India.

100A Sword—Scabbard covered with green velvet, and mounted with gold, set with rubies and emeralds;

gold bosses of waist belt inlaid with diamonds, rubies, and emeralds; sword knot and tassels decorated with pearls. Presented to Viscount Gough by Rajah Shere Singh, Punjab.

101A Dagger—Damascus blade, sheath elaborately enamelled in colours. Presented to Viscount Gough by Rajah Shere Singh, Punjab.

102A Model, in marble and mosaic, of Sarcophagus of Noor Mahal, wife of Shah Jehan, Emperor of Delhi. From original in the Taj Mahal, Agra.

103A Model, in silver, of the Kootah Minar, Delhi.

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FROM THE INDIAN MUSEUM, LONDON—  
EXHIBITED BY AUTHORITY OF THE  
SECRETARY OF STATE FOR INDIA.

#### CLASS I.—SECTION I.

##### MAPS AND PLANS.

Topographical Model of India, constructed by R. Montgomery Martin, Esq. Distinctive colouring indicates the varied fluvial drainage; each shade of colour shows the extent of country drained by the main river, which flows through it, and discharges its waters into the sea. Horizontal scale 1 inch to 15 miles. Vertical scale about 1 inch to 3,000,000 feet. For the lesser heights of the Himalaya range the horizontal scale slightly differs. The white ridge on the culminating parts of the Himalaya represents the line of perpetual snow. The sandy tract near the Indus shows the great desert, the limits of which are very imperfectly known. The lines of railways are coloured red.

#### SECTION II.—MINERALS AND MINING.

1, 2 Saltpetre (*nitrate of potash*), Nellore and Salem. 3, 4 Black salt, Bengal and Madras.

5 Pungah salt, Cuttack.

6 Sal ammoniac (*chloride of ammonium*).

7 Crude carbonate of soda, Orissa.

8 Carbonate of soda, Calcutta.

9 Tincal or borax (*biborate of soda*).

10, 11 Green copperas (*sulphate of iron*), and Blue stone (*sulphate of copper*), Calcutta.

12 Alum. 13 Sulphur, Rangoon.

14 Petroleum, Pegu, 15 Peat, near Calcutta.

16 Ball coal, Dumarkhunda. 17 Coal, Burdwan.

18 Steam coal, Bancorah.

19, 20, 21 Plumbago, or graphite, Travancore, Travandrum, and S. India.  
 22 Fuller's earth, Scinde. 23 Pipe clay, Raepore.  
 24 Fire clay, Madras.  
 25, 26 Porcelain clay, Mangalore, and Canara.  
 27, 28, 29 Kaolin, red and yellow ochre, Madras.  
 30 Ball clay, Mangalore. 31 Mica, Salem.  
 32 White soapstone, Ganjam.  
 33, 34, 35 Corundum, Salem, and Madras.  
 36 Crude Arsenic, Madras. 37 Orpiment, Pegu.  
 38 Antimony ore, Kandahar.  
 39 Galena (*sulphuret of lead*). 40 Tin ore, Kohun.  
 41 Copper ore (*green carbonate*) Singboom.  
 42, 43, 44 Iron sand, Nepaul, and Shenkotah.  
 45, 46 Magnetic Iron ore, Salem, and Madras.  
 47, 51 Iron ore, Madras, Kumaon, Shahabad, and Assam. 52, Chrome Iron ore, S. Arcot.

### CLASS III.—AGRICULTURAL PRODUCE.

53, 54 Cholum (*Sorghum vulgare*); Spiked millet (*Penicillaria spicata*), Madras.  
 55, 56 Italian millet (*Setaria Italica*); Little millet (*Panicum miliare*), Madras.  
 57, 58, 59 Millet (*Paspalum scrobiculatum*, *Eleusine stricta*, and *E. coracana*), Madras.  
 60 to 69 Paddy (*Oryza sativa*), Mangalore, viz.:—  
 Kalame, jeersali, maskatty, black paddy, red kalame, white maskatty, somasale, chokambally, kinni bitta, amate. 70 Paddy, mutta kar (*Oryza sativa*), Madras.  
 71, 72, 73 Wheat (*Triticum vulgare*), Bangalore.  
 74, 75 Barley (*Hordeum vulgare*), N.W. Provinces and Nepal. 76 Oats (*Avena sativa*), Monghyr.  
 77, 78 Maize (*Zea Mays*), Madras and Mldnapore.  
 79-82 Great millet, white (*Sorghum vulgare*), Madras, &c., yellow; red, Scinde.  
 83, 84 Spiked Millet (*Penicillaria spicata*), Bengal and Madras.  
 85, 86, 87 Italian millet (*Setaria Italica*), Madras, Bellary, and Lucknow.  
 88 Quail's eye millet (*Panicum miliaceum*), Madras.  
 89, 90 Millet (*Panicum miliaceum*), Madras, &c.  
 91, 92 Millet (*Panicum miliare*), Madras and Travancore. 93, 94 Millet (*Panicum frumentaceum*), Almorah and Rawulpore.  
 95 Millet (*Paspalum scrobiculatum*), Madras.  
 96, 97 Millet (*Eleusine coracana*) Madras & Cuttack.  
 98, 99 Millet (*Amaranthus gangeticus*), and buckwheat (*Polygonum tartaricum*), Gurhwal.  
 100 Bamboo grain (*Bambusa arundinacea*), India.  
 101 to 105 Paddy (*Oryza sativa*), wallay sumba, busya, toung byan, gua monkway, Madras, Lucknow, Assam, Moulmein, Arracan.  
 106 Table rice (*Oryza sativa*), Madras.  
 107-110 Rice (*Oryza sativa*), hunsraj, rouk mway, Beerbhoom, Allahabad, Rangoon, Arracan.  
 111-114 Chick-pea (*Cicer arietinum*), Madras Cuttack, Rangoon, and Sindh.  
 115-118 Pigeon pea (*Cajanus indicus*), Madras, Lucknow, and Raepore.  
 119 White pea (*Pisum sativum*), Madras.  
 120 Field Pea (*P. arvensis*), Lucknow.  
 121, 122 Lentils (*Ervum Lens*), Sagur, Central India, and Sirinuggars, Kashmir.  
 123 Vetch (*Lathyrus sativus*) Sindh.  
 124, 125 Egyptian bean (*Lablab vulgaris*), Bombay and Madras.  
 126-129 China bean (*Dolichos sinensis*), India and Rangoon. 130, 131 Madras horse bean (*Dolichos uniflorus*), Madras. 132 Soy bean (*Soja hispida*).  
 133-136 Kidney bean (*Phaseolus Roxburghii*), Rangoon, and (var. *aureus*) Calcutta, and husked, Hooghly.  
 137, 138 Kidney bean (*Phaseolus mungo*), Cuttack and Rangoon.  
 139, 140 French bean (*P. vulgaris*). Little kidney bean (*P. acutifolius*), Madras.  
 141, 142 Arrowroot (*Moranta arundinacea*), Calcutta, and (*Curcuma angustifolia*).

143 Tapioca (*Jatropha Manihot*), Allepore.  
 144 Sago flour (*Raphia Rumphii*), Sarawak.  
 145, 146 Brown and Pearl sago, Singapore.  
 147 Imitation Sago (*Tacca pinnatifida*), Mergui.  
 148 Beychundie (source unknown), Jubbulpore.  
 149 Mooslee (*Murdannia scapiflora*), Bombay.  
 150 Salep (*Eulophia sp.*), Punjab.  
 151-154 Coffee, Mangalore, Burmah, Aden, Travancore. 155 Peaberry Coffee, Mysore.  
 156, 157, 158 Cannon's Mysore, and coffee, Mysore.  
 159-166 Coffee, Animal Hills, Coimbatore, Chota Nagpore, Chittagong, and Penang.  
 167-215 Teas from Assam, Cachar, Sylhet, Dazjeeling, and Dehra Doon.  
 216-218 Souchong from Gurhwal.  
 219-246 Teas from Kumaon and Kangra.  
 247-252-Sugar (*Saccharum officinarum*), Lucknow, Astagram, Shahjehanpore.  
 253, 254 Date sugar (*Elate sylvestris*), Bengal.  
 255 Palm sugar (*Nipa fruticans*).  
 256 Sugar candy (*Saccharum officinarum*), Madras.  
 257, 258 Ginger (*Zingiber officinalis*), Bengal, and Malabar. 259-260 Turmeric (*Curcuma longa*), Bengal and Malabar.  
 261-267 Cloves (*Caryophyllus aromaticus*), nutmegs (*Myristica moschata*), mace and pepper (*Piper nigrum*), from Penang.  
 268 Long pepper (*Charica Roxburghii*), W. India.  
 269 Cubeb pepper (*Piper Cubeba*), Bengal.  
 270 Star anise (*Illicium anisatum*), Calcutta.  
 271 Poppy seed (*Papaver somniferum*), Bengal.  
 272 Poodina (*Mentha sativa*), Bengal.  
 273 Tejpai leaves (*Cinnamomum sp.*) Calcutta.  
 274 Cinnamon (*Cinnamomum zeylanicum*), Malabar.  
 275 Cassia (*Cinnamomum sp.*), Bengal.  
 276 Cassia (*Cinnamomum Louriero*), Travancore.  
 276A B C Tobacco (*Nicotiana rustica*), Rangoon, Ahmedabad, Mysore. 277-280 Betel nuts (*Areca Catechu*), Bengal and Travancore.  
 281 Bhang (*Cannabis sativa*), Himalayas.  
 282 Dhatura (*Datura metel*), Bengal.  
 283 Poppy petals for packing opium (*Papaver somniferum*). 284-286 Opium (*Papaver somniferum*), Candish, Punjab, and Bengal.

### CLASS IV.—SUBSTANCES USED IN MANUFACTURES.

287-289 Linseed and oil (*Linum usitatissimum*), Bengal, Bombay, Mirzapore.  
 290 Rape seed and oil (*Sinapis dichotoma*), Ferozepore.  
 291, 292 Rape (*Sinapis glauca*), Guzerat and Bombay.  
 293, 294 Mustard (*Sinapis ramosa*), Calcutta and Bombay.  
 295, 299 Sesame (*Sesamum orientale*), Chingleput, Madras, Calcutta.  
 300 Ben seed (*Moringa pterosperma*), Madras.  
 301, 302 Poppy seed and oil (*Papaver somniferum*), Bengal and Behar.  
 303 Cordy seed and oil (*Carthamus tinctorius*), Madras.  
 304 Ramtil seed (*Guizotia oleifera*), Bengal.  
 305, 306 Castor seed and oil (*Ricinus communis*), S. India.  
 307 Croton seed and oil (*Croton Tiglium*), Madras.  
 308 Cucumber seed and oil (*Cucumis sativus*).  
 309, 310 Ground nuts and oil (*Arachis hypogaea*), Madras.  
 311 Pinnay seeds and oil (*Calophyllum Inophyllum*), Madras.  
 312, 313 Poonga seeds and oil (*Pongamia glabra*), Pulas seeds (*Butea frondosa*), Madras.  
 314 Cashew nuts (*Anacardium occidentale*).  
 315 Marking nuts (*Semecarpus anacardium*).  
 316 Soap berries (*Sapindus emarginatus*).

- 317 Mowha oil (*Bassia longifolia*), Canara.  
 318 Illopie (*Bassia latifolia*).  
 319 Margosa oil (*Azadirachta Indica*).  
 320 Piney tallow (*Vateria Indica*), Canara.  
 321 Kokum butter (*Garcinia purpurea*).  
 322 Nutmeg fat (*Myristica moschata*), Penang.  
 323-325 Cocoa nut oil (*Cocos nucifera*), stearine candles, Canara.  
 326 Vegetable wax, from Castor oil.  
 327-329 Babool gum (*Acacia Arabica*), Bengal and Calcutta.  
 330 Margosa gum (*Azadirachta Indica*).  
 331 Woodier (*Odina wodier*)?  
 332 Marking nut gum (*Semecarpus anacardium*).  
 333 East India gum of commerce, mixed.  
 334 Taca gum (*Vachellia farnesiana*).  
 335 Kheir gum (*Acacia catechu*).  
 336 Caju gum (*Anacardium occidentale*).  
 337, 338 False tragacanth (*Cochlospermum gossypium*), Bengal and Madras.  
 339 Kuteera (*Sterculia urens*).  
 340 Dhoori gum (*Grislea tomentosa*), Ahmedabad.  
 341 Dragon's blood, Bombay.  
 342 Kino (*Pterocarpus marsupium*), Malabar.  
 343 Butea kino (*Butea frondosa*).  
 344 Palachy kino (*Butea superba*), W. Coast.  
 345 Gamboge (*Garcinia morella*).  
 346 Gamboge (*Garcinia pictoria*), Mysore.  
 347 Benzoin (*Styrax benzoin*).  
 348, 349 Olibanum (*Boswellia papyrifera*), Bombay, (*Terminalia angustifolia*).  
 350, 351 Gogul (*Balsamodendron agallocha*), Calcutta, and (*B. Roxburghii*), Scinde.  
 352 Myrrh (*B. myrrha*), Bombay.  
 353 Ammoniac (*Dorema ammoniacum*), Bengal.  
 354 Asafetida (*Narthex asafetida*), Bengal.  
 355 Dika-mali (*Gardenia lucida*), Bombay.  
 356 Bombay aninib, derived from Zanzibar.  
 357 Piney resin (*Vateria Indica*), Canara.  
 358 Black dammar (*Canarium strictum*), Travancore.  
 359, 360 Sal dammar (*Shorea robusta*), Bengal and Burmah.  
 361 Pauchentee (*Isonandra acuminata*), Wynaad.  
 362 Cattimandoo (*Euphorbia cattimandu*), Vizagapatam.  
 363 Mudar gutta (*Calotropis gigantea*), Gorruckpore.  
 364 Gutta percha (*Isonandra gutta*), Malay peninsula.  
 365, 366 Caoutchouc (*Urostigma elastica*), Assam and India.  
 367-373 Indigo, Madras, Vellore, Pondicherry, Cuddapah, N. Arcot, Salem.  
 374 Madder (*Rubia tinctoria*) Himalayas.  
 375, 376 Munjeet (*Rubia cordifolia*), Assam.  
 377 Chay root (*Oldenlandia umbellata*).  
 378, 379 Al root (*Morinda citrifolia*).  
 380 Publichuckay (*Ventilago maderaspatana*), Madras.  
 381 Ekalbir (*Datisca cannabina*), Himalayas.  
 382 Saphan wood (*Caesalpinia Sappan*), Pegu.  
 383 Turmeric (*Curcuma longa*), Bengal.  
 384 Kamala (*Rottlera tinctoria*), Bengal.  
 385 Hooley powder (*Trapa bispinosa*), Calcutta.  
 386 Safflower (*Carthamus tinctorius*), Dacca.  
 387 Hursinghar (*Nyctanthes arborescens*), Bombay.  
 388 Tisso flowers (*Butea frondosa*), Bombay.  
 389 Green dye (*Jatropha* sp.), Malda.  
 390 Moocherus (*Areca Catechu*, exudation), Bombay.  
 391 Dye lichen, orchil (*Rocella fuciformis*), Travancore.  
 392 Turwar bark (*Cassia auriculata*), Chingleput.  
 393, 394 Tengh bark (*Rhizophora* sp.), and Mangrove bark (*R. Mangle*), Singapore.  
 395 Babool bark (*Acacia Arabica*), Bengal.  
 396 Cassia fistula bark (*Cathartocarpus fistula*), Madras.  
 397, 398 Chebulic myrobalans (*Terminalia Chebula*), Bengal and Bombay.  
 399 Beleric myrobalans (*Terminalia Bellerica*).

- 400 Aomla (*Phyllanthus emblica*).  
 401 Galls (*Quercus infectoria*), and Tamarisk galls (*Tamarix Indica*), Bombay.  
 403-405 Catechu (*Acacia Catechu* and *Areca Catechu*), Pegu.  
 406 Gambir (*Nauclea Gambir*), Singapore.

## MATERIA MEDICA.

- 407, 408 Bish (*Aconitum ferox*), and Atees (*A. heterophyllum*), Himalayas.  
 409 Teeta (*Coptis teeta*), Assam.  
 410 Black cummin (*Nigella sativa*), Calcutta.  
 411 Star anise (*Illicium anisatum*), Bombay.  
 412 Gooluncha (*Tinospora cordifolia*), N.W. Provinces.  
 413 Cocculus Indicus (*Anamirta Cocculus*), Bombay.  
 414 Tamala (*Nelumbium speciosum*), Calcutta.  
 415 Post (*Papaver somniferum*), Bengal.  
 416 Screw pine (*Helicteres Isora*), Madras.  
 417 Bael (*Egle Marmelos*).  
 418 Neem bark (*Azadirachta Indica*), Bengal.  
 419 Gookhroo (*Tribulus terrestris*), Bombay.  
 420 Marking nuts (*Semecarpus anacardium*), Madras.  
 421 Babool bark (*Acacia Arabica*).  
 422 Fenugreek (*Trigonella fenumgræcum*).  
 423 Bonduc nuts (*Gailandina Bonduc*), Calcutta.  
 424, 425 Senna (*Cassia lanceolata*), Tinevelly and Bombay.  
 426 Chaulmoogra (*Chaulmoogra odorata*), Chittagong.  
 427 Colocynth (*Citrullus pseudo-colocynthis*).  
 428 Indian Pennywort (*Hydrocotyle Asiatica*).  
 429 Sowa (*Anethum sowa*), Calcutta.  
 430 Ajwan (*Ptychotis ajowan*), Bombay.  
 431 Cumin (*Cuminum cyminum*).  
 432 Coriander (*Coriandrum sativum*), Bombay.  
 433 Caraway (*Carum nigrum*), Bombay.  
 434 Chay root (*Oldenlandia umbellata*).  
 435 Pieraloo (*Randia dumetorum*).  
 436 Root of *Notonia grandiflora*.  
 437 Chicory seeds (*Cichorium Intybus*), Bombay.  
 438 White behen (*Centaurea behen*), Punjab.  
 439 Pellitory (*Pyrethrum Indicum*).  
 440 Baiberung (*Embelia ribes*), N.W. Provinces.  
 441 Anta moole (*Hemidesmus Indicus*).  
 442 Indrawan (*Wrightia antidysenterica*).  
 443 Satween (*Alstonia scholaris*).  
 444 Strychnos nux vomica, Malabar.  
 445 Clearing nuts (*S. potatorum*), Bombay.  
 446 Chiretta (*Agathotes Charytta*).  
 447 Gookhroo (*Petalium murex*), Bombay.  
 448 Turbith (*Ipomea turpethum*), Bombay.  
 449 Kala dana (*Pharbitis nil*).  
 450 Kahtee karee (*Solanum Jacquinii*), Bombay.  
 451 Dhatoora (*Datura Metel*), Calcutta.  
 452 Chitra (*Plumbago rosea*), Bengal.  
 453 Isabghool (*Plantago Ispaghula*).  
 454, 455 Rhubarb (*Rheum emodi*), Outer Himalayas, and (*R. sp.*), Mid Himalayas.  
 456 Beleric myrobalans (*Terminalia Bellerica*).  
 457, 458 Chebulic myrobalans (*Terminalia chebula*), Bengal and Calcutta.  
 459 Kamala (*Rottlera tinctoria*), Madras.  
 460 Castor oil seeds (*Ricinus communis*), Bombay.  
 461 Croton seeds (*Croton Tiglium*), Madras.  
 462 Pepper (*Piper nigrum*), Travancore.  
 463 Pepper root (*Chavica Roxburghii*), Madras.  
 464, 465 Cubebs (*Piper cubeba*), and Aloes (*Aloe Indica*), Bombay.  
 466, 467 Suffaid moosalie (*Murdania scapiflora*), and Orris root (*Iris Florentina*).  
 468 Costus (*Aucklandia costus*), N.W. Provinces.  
 469, 470 Turmeric (*Curcuma longa*), Bengal, and (*Curcuma* sp.), wild, Madras.  
 471 Ginger (*Zingiber officinale*), Bengal.  
 472 Kupoor kuchree (*Hedychium spicatum*), N. W. Provinces.  
 473 Cardamoms (*Elettaria cardamomum*), Malabar.

- 474 Sweet cane (*Calamus aromaticus*).  
 475 Sedge, mootha (*Cyperus longus*) Madras.  
 476 Betel nuts (*Areca Catechu*), Travancore.  
 477 Patchouly (*Pogostemon patchouli*).  
 478 Indian absinth (*Artemisia Indica*), Bengal.  
 479 Khus khus (*Anatherum muricatum*), Calcutta.  
 480 Sandal wood (*Santalum album*), Mysore.  
 481, 482 Lemon grass (*Andropogon citratus*); Citronelle (*A. Schenanthus*), Penang.  
 483 Jatamansi (*Nardostachys jatamansi*).  
 484 Gharoo (*Aquilaria agallocha*), Pahang.  
 485 Azarbutties, or scented pastiles, Calcutta.  
 486 Scented powder employed by Mahometan bride and bridegroom, Madras.

## ANIMAL PRODUCTS.

- 487-495 Stick lac.  
 496 Kuthee lac, Jubbulpore.  
 497 Lac, from Bur (*Ficus Indica*).  
 498-500 Grain lac, Jubbulpore and Madras.  
 501-503 Shell lac, Patna.  
 504-505 Lac dye, Calcutta.  
 506-510 Bees' wax, Travancore, Pegu, Rangoon, Indian Archipelago.  
 511-515 Raw silks, Lucknow, Umritsur, Bengal, and Pegu.  
 516 Floss silk, dyed colours, Umritsur.  
 517-518 Floss silk, Moulmein, and Eria, dyed, Assam.  
 519, 520 Tusseh silk-worm cocoons, and raw Tusseh silk, Bhagulpore.  
 521-529 Silk-worm cocoons, and raw silk, Assam.  
 530-535 Sheep's wool, Cuttack, Mysore, Khelat, Darjeeling, and Thibet.  
 536 Rong Bang, Valley sheep's wool.  
 537 Che Bal, Highland sheep's wool.  
 538 Sheep's wool, Shikarpore.  
 539 Lamb's wool, Jesselmere.  
 540 Dhumba sheep's wool, Lahore.  
 541-548 Kashmere goat's wool, cleaned, and Cabul goat's wool, Umritsur.  
 549, 550 Goat's wool and Yak's wool, Yarkend.  
 551 Camel's hair, Hyderabad.

## VEGETABLE FIBRES.

- 552-556 Flax (*Linum unitatissimum*), Punjab and Lucknow.  
 557-561 Rhea (*Bahmeria nirea*), Assam.  
 562 Wild Rhea (*B. sp.*), Assam.  
 563, 564 Puya stems and fibre (*B. Puya*), Deyra Dhoon, and N. W. Provinces.  
 565 Nilgiri nettle (*Urtica heterophylla*), Madras.  
 566, 567 Yecum (*Calotropis gigantea*), Punjab and Madras.  
 568 Jute (*Corchorus olitorius*), Darjeeling.  
 569 Sufet Bariala (*Sida rhomboides*).  
 570, 571 Ambaree (*Hibiscus cannabinus*), and Roselle (*H. sabdariffa*), Madras.  
 572 Indian Mallow (*Abutilon Indicum*), Madras.  
 573 Bunochra (*Urena lobata*), Burmah.  
 574-575 Himalayan hemp (*Cannabis sativa*), Punjab and Kangra.  
 576, 577 Sunn hemp (*Crotalaria juncea*), Raepore and Hooghly.  
 578 Jubbulpore hemp (*Crotalaria tenuifolia*).  
 579 Pine apple (*Ananassa sativa*).  
 580 Moorva (*Sansieria zeylanica*), Madras.  
 581, 582 Agave (*Agave Americana*), Meerut and Madras.  
 583, 584 Adam's needle (*Yucca gloriosa*); Plantain (*Musa paradisiaca*), Madras.  
 585 Screw pine (*Pandanus odoratissimus*), Madras.  
 586 Gomuti (*Arenga saccharifera*), Singapore.  
 587 Moorj (*Saccharum Munjiu*), Lahore.  
 588 Palmyra (*Borassus flabelliformis*).  
 589 Mat grass (*Cyperus textilis*), Madras.  
 590 Coir (*Cocos nucifera*), Madras.  
 591-673 Specimens of cotton from all parts of India.

## TEXTILE FABRICS.

- 673A Cabinet, containing specimens of the textile fabrics of India, prepared under the direction of the Reporter on Indian products.  
 673B Frame, containing coloured photographs, showing the costumes of the people of India.—(See photographic illustration.)  
 673C Map of Routes from India to the interior of Asia, &c., constructed for the Department of the Reporter on the Products of India, by Edward Stanford, Charing-cross, London.  
 674 Cotton counterpane, elaborately quilted—Hyderabad, Deccan.  
 675 Cotton piece, printed with gold—Jeypore.  
 676-678 Circular cotton pieces, printed with silver—Bengal.  
 679-681 Jamdane muslin and scarfs, plain and coloured—Dacca.  
 682 Fine plain muslin piece—Dacca.  
 683-684 Plain muslin piece, and yellow muslin rumal or kerchief—Hyderabad.  
 685, 686 Mulmul Khass and Sircar Ally, plain muslin—Dacca.  
 687, 688 Muslin piece and cheek muslin piece—Chundarie, Bengal.  
 689, 690 Saree striped and plain muslin—Santipore, Calcutta.  
 691 Kashmere shawl of the finest quality—Kashmere.  
 692 Kashmere scarf, woven with gold and silver border and ends—S. India.  
 693 Kashmere scarf piece, embroidered with gold and silver corners—Umritsur.  
 694 Kashmere waist-band, sent from Delhi.  
 695 Crimson Kashmere shawl cloth, embroidered with gold at Madras.  
 696 Black Kashmere scarf, embroidered with gold—Delhi.  
 697 Crimson Kashmere scarf, embroidered with gold and silver—Delhi.  
 698 Blue Kashmere scarf, embroidered with white floss silk—Delhi.  
 699 Crimson Kashmere scarf, embroidered with gold and silver—Delhi.  
 700 Kashmere choga, embroidered with gold and silver—Lahore.  
 701 Blue Kashmere scarf, embroidered with silver—Dacca.  
 I. Orange Kashmere shawl, finest quality—Kashmere.  
 II. Black Kashmere scarf, embroidered with orange floss silk—Delhi.  
 A. III. Black Kashmere scarf, embroidered with white floss silk—Delhi.  
 IV. White Kashmere choga, embroidered with crimson silk—Kashmere.  
 Contributed by Col. Meadows Taylor, Oldcourt, Harold's cross, Dublin.  
 702 Burmese silk cloth, worn by men round the waist.  
 703 One piece of Mushroo (silk and cotton)—Hyderabad, Deccan.  
 704-808 Lace manufactured by the native girls in the Mission School, Edyengoody, Tinnevely.  
 709-738 Lace manufactured at Travancore, Mangalore, and Hyderabad, Deccan.  
 739-750 Net scarfs, worked with silk of various colours and embroidered, from Delhi.  
 751-753 White net scarfs, richly embroidered—Madras.  
 754 White net collar, embroidered—Madras.  
 755 Black net scarf, embroidered with gold—Madras.  
 756 White net dress skirt, embroidered with gold and beetle wings—Hyderabad.  
 757 Superior worked lace, Honiton pattern, manufactured at Madras.  
 758, 759 White muslin head-cloths, richly embroidered with gold—Madras.

760, 761 White muslin dress piece and skirt, richly embroidered—Madras.  
 762 White muslin piece, embroidered with gold—Decca.  
 763, 764 Muslin dress pieces, called Booteah—Dacca.  
 765 Crimson muslin scarf, embroidered with gold—Kotah.  
 766 Black muslin scarf, embroidered with gold—Bhurtpore.  
 767, 768 Crimson muslin scarfs, worked with silver and gold stripes and border—Bhurtpore.  
 769 Doria muslin scarf, worked with massive gold—Chundare.  
 770-772 Embroidered muslins—Dacca.  
 773 Dress piece, embroidered at Madras.  
 774-778 Boddice pieces, worked with gold—Surat and Ahmedabad.  
 779 Slipper fronts, embroidered with silk thread on English cloth—Scinde.  
 780-785 Bottle stands, chair covers, &c., embroidered with floss silk and gold on English broadcloth—Scinde.  
 786 Black satin apron, embroidered with coloured silk thread—Scinde.  
 787 Richly gold-embroidered shawl end, worked with pearls—Triplicane, Madras.  
 788 Silver and gold lace band—Madras.  
 789 Silver lace band, embroidered with silk—Madras.  
 790 Waist bands (three) embroidered with gold—Madras.  
 791, 792 Silk carriage lace, white, embroidered.  
 793-796 Massive gold and silver lace.  
 797, 798 Gold tassels and cord—Madras.  
 799-801 Purses embroidered with gold and set with stones and pearls—Delhi.  
 802 Velvet breast ornament (placed on idols during festivals), embroidered with gold and set with stones and pearls—Madras.  
 803, 804 Velvet purses embroidered—Benares.  
 805-857 Gold embroidered tops for caps—Surat.  
 808 Slipper piece, gold embroidered—Madras.  
 809 Spice bag, gold embroidered, with two pendent enamelled balls, &c.—Malwa.  
 810 Circular piece, gold, embroidered on purple velvet—Triplicane, Madras.  
 811 Blue satin parasol, embroidered with gold, handle of silver—Nepal.  
 812, 813 Small circular table mats, embroidered with gold—Benares.  
 814, 815 Small purse-bags, worked with silver, lace, and spangles—Benares.  
 816 Two Sindee books, with gold and silver embroidered covers—Scinde.  
 817 Kincoob scarf, embroidered with silver and gold border—Benares.  
 818 Gold cloth, embroidered with silver and beetle-wings—Madras.  
 819-824 Kincoobs, embroidered and worked with gold, &c.—Hyderabad, Benares, and Ahmedabad.  
 825 Gold cloth scarf, worked with silver and beetle-wings—Amedababad.  
 826 Silk rug—Tanjore.  
 827 Crimson velvet carpet, richly embroidered with gold—Hyderabad, Deccan.  
 828 Waist-belt, velvet, embroidered with gold—Moorshedabad.  
 829 Waist belt of massive gold lace, with silver gilt plate and buckle—Lahore.  
 830 Embroidered badge, worn by Poons—Bangalore.  
 831-834 Waist-belts, leather, embroidered—Madras.  
 835 Gold lace cord and tassels, worn by bandsmen of the Rajah of Mysore.  
 836 Gold lace cap.  
 837 Topee, worked with gold and spangles—Madras.  
 838 Cashmere cloth coat, embroidered with gold—Lucknow.

839 Two Gotohars, or emblems of Royalty—Lucknow.  
 840 Waist-band (green and red), worked with gold ends—Satara.  
 841 Dooputtah, richly ornamented with gold and silver trimmings—Nepal.  
 842 Plate, basin, and cover of Bidree ware—Hyderabad, Deccan.  
 843 Hookah bottom of Bidree ware—Hyderabad, Deccan.  
 844, 845 Spittoon and stand, with perforated top.  
 846 Water jug, of metal—Lahore.  
 847, 848 Brass bell—Tanjore, and another (Lamas bell) Tibet.  
 849-851 Copper dish, embossed; brass dish, engraved and embossed; and brass jumboo, for holding water—Madras.  
 852, 853 Brass goblets, with figures of Vishnu—Madras.  
 854 Brass drinking vessel, with spout—Travancore.  
 855-857 Brass lotah for water, and stand; and chumboo, for holding water—Benares.  
 858 Hookah complete, Sawunt Waree—Bombay.

## JEWELLERY AND ARTICLES OF VERU.

359 Bracelet set with turquois, polished gold and enamelled back—Delhi.  
 860 Necklace, of sixteen enamelled plates, intersected with rubies—Indore.  
 861 Surpeish, or turban ornament, set with diamonds, pearls and emeralds—Benares.  
 862 Medallion-shaped brooch, enamelled—Indore.  
 863 Anklet, set with twenty-two large precious stones, each stone opening as a box—Calcutta.  
 864-866 Bangles, enamelled and set with diamonds—Bengal.  
 867 Necklace of seventeen large pearls and eighteen emeralds—Calcutta.  
 868 Bangle, set with fifty-seven diamonds and three emeralds—Bengal.  
 869 Head ornament, turquois, rubies, and pearls—Delhi.  
 870 Necklace, enamelled, set with pearls and table diamonds—Delhi.  
 871 Pair of ear-rings, set with diamonds, pearls, and oriental rubies—Delhi.  
 872 Gold bracelet, finely chased, set with rubies—Madras.  
 873, 874 Gold bracelets—Ava.  
 875 Gold filagree ball bracelet.  
 876 Chased gold necklace of gold coins—Madras.  
 877 Gold rose cut chain—Trichinopoly.  
 878 Gold girdle or chain, snake pattern—Trichinopoly.  
 879 Small circular gold box, set with rubies—Ava.  
 880 Small gold filagree box, set with rubies and emeralds—Ava.  
 881 Small gold cup, massive, set with rubies—Ava.  
 882 Gold bowl, richly embossed—Ava.  
 883 Gold filagree hexagonal box, cut from solid gold plates—Vizagapatam.  
 884 Silver filagree tray, containing nine boxes of spices—Hyderabad.  
 885 Perforated hexagonal box, silver gilt, Malwa.  
 886, 887 Silver gilt rose-water sprinklers, or golab pash—Malwa.  
 888 Silver gilt embossed plate—Malwa.  
 889, 890 Silver embossed and enamelled vases—Kangra.  
 891-894 Silver filagree card baskets, and casket—Cuttack.  
 895 Carved jade dish—Hyderabad.  
 896-899 Cups and saucers of blood stone, moss-gate, and agate—Cambay.  
 900 Vase, cover, and plate of jade—Bengal.  
 901-904 Crystal vases and covers, crystal cup and jasper bangle—Lahore.

- 905 Necklace ornament of jade, set with rubies and turquois.  
 906 Necklace of red rock crystal—Ahmedabad.  
 907 Mosaic table top—Agra.  
 908, 909 Carved soapstone dishes—Agra.  
 910-912 Water bottle of black and red pottery—Patna, Kotah, and Benares.  
 913 Basin and cover of painted pottery—Allahabad.  
 914 Two glazed tiles—Hyderabad, Sind.  
 915, 916 Elephants and howdahs, carved in ivory—Berhampore.  
 917 Vase and cover, carved in ivory—Travancore.  
 918, 919 Carved ivory combs and back-scratcher—Assam.  
 920 Ivory paper knife—Umritsar.  
 921-925 Carvings in horn—Vizianagaram.  
 926 Work-box of porcupine quills—Vizianagaram.  
 927, 928 Papier maché pen-trays, &c.—Lahore.  
 929, 930 Boxes of carved sandal-wood, ivory, and inlaid work—Bombay.  
 931, 932 Boxes of fluted ivory—Bombay, and of stag's horn—Madras.  
 933 Portfolio of inlaid work—Bombay.  
 934 Papier maché box—Lahore.  
 935 Palm-leaf fan, with papier maché handles—Madras.  
 936-939 Spoons, fork, and plates of carved wood—Saharunpore.  
 940, 941 Hand chowries of seetulputti fibre—Assam.  
 942, 943 Matchlocks, Toradars, ornamented—Bareilly.  
 944 Walking stick of cane, with massive gold top, enclosing a watch, writing implements, and snuff box; the opposite end of embossed gold, with compartments for holding money, Madras.  
 945 Tipu Sahib's gold-headed walking stick.  
 946 Gold-headed stick, with carved characters forming an almanac, dated 1264.  
 947 Carved wood walking-stick—Madras.  
 948 Khushkhus tray, ornamented with beetle wings—Poona.  
 949-951 Baskets of cane—Monghyr, Tinnevely, and Silhet.  
 952 Ornamented box of catjan material—Sylhet.  
 953, 954 Tom-toms—Benares.  
 955, 957 Violins—Dacca and Benares.  
 958 Scarlet cloth Dharry cover—Nepal.  
 957 The gold state chair of Runjeet Singh.

#### PHOTOGRAPHS OF THE PEOPLE OF INDIA.

Selection from a series of photographs, representing a number of the tribes and castes into which the native population of India and the adjacent country are divided; executed in the several districts, under the authority of the Supreme Government. Reproduced under the direction of the Reporter on Indian Products, at the India Museum, London, by William Griggs.

- 960 FRAME No. 1.—Thirty-two photographs of native Princes or Chiefs.  
 961 FRAME No. 2.—Bengal (Chota, Nagpore, &c.): Bhagulpore, 2 subjects; Behar, 6; Shahabad, 1; Chota Nagpore, 14.  
 962 FRAME No. 3.—Assam and Eastern Himalayas:—Assam, 5 subjects; Cachar, 3; Muneepore, 2; Koch Behar, 1; Sikkim, 8; Bhotan, 3; Thibet, 3.  
 963 FRAME No. 4.—North-Western Provinces:—Benares, 3 subjects; Allahabad, 16 subjects; Allygurh, 9.  
 964 FRAME No. 5.—North-Western Provinces:—Benares, 3 subjects; Allahabad, 5; Agra, 2; Allygur, 16.  
 965 FRAME No. 6.—N.W. Provinces:—Meerut, 4 subjects; Delhi, 13.  
 966 FRAME No. 7.—N.W. Provinces:—Delhi, 16 subjects.  
 967 FRAME No. 8.—N.W. Provinces and Oude:—

Goruckpore, 4 subjects; Oude, 4; Shahjehanpore, 5; Bareilly, 18.

968 FRAME No. 9.—N.W. Provinces and Oude:—Goruckpore, 2 subjects; Oude, 8; Shahjehanpore, 2; Bareilly, 8.

969 FRAME No. 10.—N.W. Provinces:—Moradabad, 6 subjects; Saharunpore, 14; Dehra Doon, 5.

970 FRAME No. 11.—Western Himalayas and Nepal:—Simla, 11 subjects; Kumaon, 3; Nepal, 12.

971 FRAME No. 12.—The Punjab:—Lahore, 23 subjects.

972 FRAME No. 13.—The Punjab: Lahore, 10 subjects; Hissar, 5; Googaira, 9.

973 FRAME No. 14.—Punjab and Western Himalayas:—Ferozepore, 4 subjects; Goojranwalla, 2; Jhelum, 8; Kangra Hills, 7; Kohat, 7; Huzara, 6; Gundapoor, 1; Cabul, 2; Kandahar, 1.

974 FRAME No. 15.—Scinde, 15 subjects.

975 FRAME No. 16.—Scinde, 30 subjects.

976 FRAME No. 17.—Scinde, 34 subjects.

977 FRAME No. 18.—Central Provinces:—Bhurlpore, 11 subjects; Rajpootana, 2.

978 FRAME No. 19.—Central Provinces:—Berar, 30 subjects; Indore, Sillana, &c., 19.

979 FRAME No. 20.—Central Provinces:—Nursingpore, 3 subjects; Sangor, 9; Jubulpore, 6; Seonee, 6.

980 FRAME No. 21.—Madras and Northern Circars:—Northern Circars, 13 subjects; Kurnool, 2; Coimbatore, 10; Coorg, 11.

981 FRAME No. 22.—Madras and Mysore:—Chingleput, 1 subject; Mysore, 29 Travancore, 8.

982 FRAME No. 23.—Burmah and the Himalayan Peninsula.—Akyab, 1 subject; Burmah, 6; Prince of Wales Island, 2; Singapore, 9.

#### RAW PRODUCTS, FROM THE LAHORE CENTRAL MUSEUM, EXHIBITED BY MR. BADEN POWELL.

983-987 Rock salt, crystals of salt, red salt (*Kheura*), and granular salt, Kheuramine, Lahore.

988-995 Specimens of salt, Lahore.

996 Crystals of pure salt, Jhelum.

997 Salt from streams in Salt Range.

998 Inferior earthy salt, "gooma loon," from Arang mine, Lower Himalayas.

999 Evaporated salt, Gurboon.

1000 Alum, as crystallized from the pans, Kalabagh.

1001 Alum from the Bazaars, Lahore.

1002, 1003 Sal ammoniac (*Nanshader*), and salt-petre (*Shora*), Lahore.

1004 Purified borax (*Sohaga*), Lahore.

1005, 1006 Crude soda (*Sajji sigah*), and refined soda (*Sajji lota*), Lahore.

1007 Kahre earth, containing protosulphate of iron, Salt Range.

1008 Kahre sated (*Anhydrous protosulphate of iron*), Salt Range.

1009 Mooltanee mitte earth, containing peroxide of iron, Saesulmeer.

1010, 1011 Hurmuzi, Indian red, and pounded talc, "abrak," Lahore.

1012 Quartz, "Kalabagh diamonds," Lahore.

1013 Coal, or lignite, Baghanwalla.

1014 Turquoises, as brought from Persia by Affghan merchants.

1015-1017 Iron sand, micaceous rock with iron sand, and hammered iron, Dhurmsala.

1018 Hematite, Gurgoon.

1019 Asbestos "sanghi Reshadar," Bunnow.

1020, 1021 Lime concrete, "kunkur," Lahore.

1022 Ekalbir (*Datisca cannabina*), Lahore.

1023, 1024 Indigo, European and native make (*Indigofera tinctoria*), Mooltan.

1025 Munjeet (*Rubia cordifolia*), Affghanistan.

1026 Kesu flowers (*Buten frondosa*), Lahore.

1027 Safflower (*Carthamus tinctorius*), Lahore.

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1028, 1029 Toon flower (*Cedrela toona*), and henna (*Lawsonia alba*), Lahore.

1030 Nettle fibre (*Urtica heterophylla*), Lahore.

1031, 1032 Dhumnun (*Grewia oppositifolia*), and Sunkokra (*Hibiscus cannabinus*), Lahore.

1033, 1034 Sunn (*Crotalaria juncea*), and rope made therefrom, Lahore.

1035-1037 Modar fibre and floss (*Calotropis procera*), Lahore.

1038 Himalayan hemp (*Cannabissativa*), Himalayas.

1039, 1040 Malun (*Bauhinia racemosa*), and rope made therefrom.

1041, 1042 String and rope of moong (*Saccharum munja*), Lahore.

1043 Niggee (*Daphne papyracea*).

1044 Putta (*Chamaecrops Ritchiana*), Peshawar.

1045 Bazaar rope (*Andropogon* sp.)

1046 Cotton from American seed, grown experimentally at Mozuffergarh.

1047 Native cotton, Gojjeruwella.

1048 Lotus fibre (*Nymphaea lotus*), Lahore.

1049 Kuffee, tinder (*Onoseria lanuginosa*), Lahore.

1050 Date palm fibre (*Elate sylvestris*), Punjab.

1051 Shoes or sandals made of grass and straw, Himalayas.

1052-1058 Rice (*Oryza sativa*), Kangra, Peshawar, and Punjab.

1059 Common red wheat (*Triticum aestivum*).

1060 Vandanak wheat.

1061 Paighambri wheat, huskless wheat.

1062 White Ghoni wheat, opaque, white, huskless.

1063 Common barley (*Hordeum hexastichon*).

1064 Paighambri, or huskless barley (*Hordeum vulgare*).

1065, 1066 Maize (*Zea Mays*), The Plains, and The Hills.

1067-1077 Specimens of millet from Lahore, The Hills, &c.

1078-1079 Pulse and peas, from Lahore and Kangra.

1088-1099 Linseed (*Linum usitatissimum*), and Sesame (*Sesamum orientale*), Lahore.

1100 Bokhara silk, Bokhara.

1101 Silk, reeled in the Punjab by Jaffeer Ali, of Goordaspore.

#### FROM THE GOVERNMENT OF THE PUNJAB.

1102 One piece of silk, purple and yellow, Bhawalpore.

1103-1105 Three Cashmere shawls, of the finest quality, Cashmere. (Presented by the Maharajah of Cashmere to the Viceroy of India).

1106 Shawl musnud, or cover, Cashmere.

1107-1109 Sonseem (mixed silk and cotton material), Bhawalpore.

1110 Camel's hair cloth, Punjab.

1111 Three saddle cloths, scarlet with gold and silver embroidery, Lahore.

1112 Posteen, or coat of goat's skin, lined with sheep's wool, Peshawar.

1113, 1114 Embroidered leather trousers, and riding boots of green leather, Kokan.

#### FROM THE PUNJAB CENTRAL COMMITTEE, LAHORE.

1115 Ghati cloth, four pieces, Hooshyarpore.

1116, 1117 Cotton checks, Loodiana.

1118 Turban piece, gold and white, Loodiana Jail.

1119 Khes, or cotton covering, Pak Puttan, Googaira.

1120, 1121 Loongees, Peshawar; used as a turban or waist-band.

1122 Six puggrees or turbans, muslin, Delhi.

1123, 1124 Chogas or gowns, Peshawar, and Huzara.

1125 Mullida Puttoo, one piece, Huzara.

1126 Choga, embroidered Pushmeena, Loodiana.

1127-1130 Rampore Chudders, Loodiana.

1131, 1132 Flannel shirt and smoking cap, Loodiana.

1133, 1134 Six scarfs, and waist-band or cummerbund, grey, Loodiana.

1135 Three silk scarfs, of colours, Mooltan.

1136, 1137 Silk (*Goolbuddun*), red and white check, and (*Salacedar*) striped, Mooltan.

1138 Flax cloth, seven yards, Googaira Jail.

1139, 1140 Two scarfs, or doputtas, and four caps, tinsel worked, Delhi.

1141 Gold lace, Delhi.

1142, 1143 Smoking caps, Loodiana.

1144 Two pairs leather trousers.

1145 A coat, trousers, cap, and waist-rope, worn by the Guddees, Kangra.

1146-1167 Silver ornaments from Delhi and Kangra.

1168 A casket of steel, inlaid with gold (*Koftgari* work), Sealkote.

1169-1172 An urn, or vase, inkstand, candlestick, paper-knife (*Koftgari*), Sealkote.

1173-1187 Specimens of lacquered turnery from Pak Puttan, Googaira, including chess table and men, (1182), &c.

1188 Spice box, studded with ivory, Dera Ismael Khan.

1189-1195 Articles of ivory and sandalwood from Umritsaur.

1196 Paper-cutters, ivory, from Delhi.

#### FROM THE CENTRAL MUSEUM, LAHORE.

1197 Tail of the yak (*Bos Grunniens*), of Thibet; used as a fly whisp.

1198 Model of an oil-mill, Lahore.

1199 Churka, or cotton cleaning machine, Lahore.

MANUFACTURED BY PRISONERS IN THE CENTRAL PRISON, LAHORE, AND FORWARDED FOR EXHIBITION BY DR. R. GRAY, SUPERINTENDENT.

1200 Flax cloth, from flax grown in the Punjab (5 yards).

1201 Large carpet, new shawl pattern, 18 feet by 15 feet.

1202 Hearth-rug, 7 feet by 5 feet.

1263 DREW, F. *Cashmere*.—Choga, or dressing gown, Pushmeena wool, embroidered, Kashmere.

1204-1205 Kummerbunds or waistbands, embroidered, Kashmere.

1206 Cloth of fine Pushmeena wool, Kashmere; 9 yards.

1207 Loonges, for wrapper, of woollen cloth, Kashmere.

1208-1209 Puttoo, thick woollen cloth, Kashmere.

1210 Khud Rung, or Puttoo cloth of the natural colour, Kashmere.

1211 Pair of woollen gloves, Kashmere.

1212 1213 Surahis or caraffes, silver.

1214 Surma-dan, or antimony box, silver.

1215-1218 A gold ring, compasses, silver gilt; compass, silver.

1219-1232 Articles in papier maché and lacquered ware, from Kashmere.

1233-1241 COWPER, F.R., C.B., *Lahore*.—Articles in papier maché and lacquered ware, from Kashmere.

1242 TAYLOR, Colonel MEADOWS, *Oldcourt, Harold's cross, Dublin*.—Shawl, orange ground, a fine specimen of ancient Cashmere manufacture, probably 100 years old.

1243-1244 Scarfs, black and blue, embroidered with white floss silk, Delhi.

1245-1246 Neck ties and choga, Kashmere, embroidered with crimson silk, Delhi.

1247 Salver of silver, embossed and chased, Sholapore, Deccan.

1248 Hookah bottom, Beder, Deccan.

1249-1250 Work-box and card-case, elaborately carved in sandalwood, Canara.

**1250A** Bracelet, gold filagree, and carbuncles, Trichinopoly.

**1250B** Bracelet, gold, set with emeralds and diamonds, Delhi.

LOVELL, J. INSPECTOR-GENERAL OF HOSPITALS.

**1251** A silver service, comprising:—coffee-pot, tea-pot, sugar-basin, cream-ewer, tankard and cover, four muffineers. Elaborately chased and embossed, Bhooj, Kutch.

**1251A** Spectacle-case, silver, richly chased, Bhooj, Kutch.

**1252** Six pairs knives and forks, richly chased, manufactured by Raalingum Assary, Moodliar; Trichinopoly, Madras.

**1253** Articles in sandalwood, from North Canara, Madras:—glove-box, card-case, and walking-stick.

**1254** HUMPHRIES, Miss.—Four carved ivory ornaments, Berhampore.

**1255** STRAHAN & Co. Dublin.—Chair and table, carved in Madras.

**1256** EVERINGTON & GRAHAM, Ludgate hill, London, E.C.—Long rose shawl, Cashmere; square gold-worked shawl, Delhi.

**1257** FARMER & ROGERS, Regent st. London, W.—Long shawl, Cashmere; square gold-worked shawl, Delhi.

**1258** WATSON, BONTOR, & Co. Old Bond st. London, W.—Large carpet, five small carpets or rugs—North-western India.

**1259** VINCENT ROBINSON & Co. 35 Welbeck st. London.—Woollen carpet—Southern India; grass-mat—Midnapore; two grass-mats—Malabar.

**1260** HADAWAY, Dr., Inspector-General of Hospitals.—Revolver, richly inlaid with gold, from Sealcote, Punjab.

**1261-62** MAGUIRE, J.—Kashmere shawls, hand-wrought, of the finest quality.

**1263** MAGUIRE, J.—Embroidered Kashmere shawl.

**1264** TAYLOR, Colonel M.—Delicate ivory carvings, from Shewapoor.

**1265** MAUNSELL, Dr. Harcourt st. Dublin.—Case of Himalayan game birds, shot by C. A. Maunsell, Esq., R.A.

**1266** TAYLOR, Colonel M. Oldcourt, Harold's cross, Dublin.—Bracelet of elephant hair; bel-fruit snuff-box, and fruit knife, set in silver.—Trichinopoly.

**1267** Bracelet of Delhi paintings; four miniatures, Delhi.

**1268** Photographs of ancient Hindû temple fifth or sixth century, A.D., at Hallibad, Mysore.

## JAMAICA.

West Gallery.

**1** JAMAICA COTTON COMPANY, 55 Charing cross, London.—Samples of cotton grown on their estates at Greenwood, Muirton, and Orange Hill, and cotton fabrics; collection of fibres adapted for spinning and paper making.

**2** ROBERTS, E. B. 239 Regent st. London.—Orange, pimento, supplejack, American briar, West India myrtle, Jamaica thorn, *Arundo tubicaria*, and other sticks, from Jamaica, in rough and finished state, for umbrellas and walking-sticks; also a selection of others from the island of Dominica.

**3** ROBERTS, G. 4 Penchurch st. London.—Large specimens of the following woods:—1. *Podocarpus coriacea* (local name yacca); 2. *Amyris* sp. (local name satin candlewood); 3. *Amyris* sp. (local name mountain torch-wood); 4. *Dipholis* sp. (local name black bullet); 5. *Psidium pomiferum* (local name guava); 6. Hogberry locust; 7. *Cocos nucifera* (local name cocoa nut).

**4** SIMMONDS, P. L. 8 Winchester st. S.W. London.—Various Jamaica woods.

**5** WILLIS, Rev. J. T. Bepton Rectory, Midhurst, Sussex.—Circular table of native woods.

**6** WILSON, N. Island Botanist.—A collection of eighty samples of fibres, barks, cotton, &c., prepared at the Botanic Gardens, Bath, by the exhibitor.

## LAGOS.

West Gallery.

SIMMONDS, E. J. L. Lagos.—Collection of woods; co or shea butter from the fruit of *Bassia Parkii*; sections of ivory; native weapons; *Achatina* shell; African mats; oil-palm fruit and nuts; Egusi oil; cottons; Talicoonah oil (*Carapa Talicoona*); country rope of bark; African dagger in sheath; hide fan; carved calabash; ground nuts on the haulm; pods of monkey pepper (*Habzelia Ethiopica*); Piper Aszelium; Bene or Gingelie oil (*Sesamum orientale*); Nankeen cotton; shell money (*Cyprea moneta*); three palm-leaf trays; cane strainer and rush strainer; five grass hats, various, and four caps; five native-carved figures; native-carved looking-glass; piece of blue country cloth; piece of grass cloth; two travelling bags, for holding cowries, fine and coarse; two bamboo mats; two rush mats; one grass mat; one piece of grass rope; five baskets of various kinds; two drums and drum sticks; native chopper; small tusk from the Niger; whip of the tail of a skate; two rhinoceros-hide whips; three walking-sticks; nine specimens of woods; calabash bottles, and five carved and plain calabashes; bees' wax; four native rings; crocodile's eggs; paddle; Kroo fiddle; model of a canoe; specimens of pottery; two-pipes; three wooden combs; three fetich masks; cane-wood; do. pounded; grass used for washing, for baskets, for lashing; for country brooms; grass and palm-leaf for mats; chew-stick; bottles of ground-nut oil; bird peppers; chillies; farina; maize; ginger; guava; cotton; honey; Indian-corn meal; rice; ground nuts.

## MALTA.

North-West Gallery.

**1** AZZOPFARDI, FRANCESCO, 4 St. George's st. Rabato Gozo.—Maltese lace, viz.:—1. Black lace flounce, £7 10s.; 2. Do. mantle, £8 15s.; 3. Do. square, £5 12s.; 4. Do. do. £9 10s.; 5. Do. Mantle, £10 2s.; 6. Do. half square, £4 11s.; 7. Do. do., £8 1s.; 8. Do. do., £7 5s.; 9. White lace square, £6 5s.; 10. Black lace square, £14; 11. Do. half square, £5 2s.; 12. Do. flounce, £7; 13. Do. skirt, £8 15s.; 14. Do. square, £24; 15. Do. half square, £4 15s. Total £131 3s.

**2** AZZOPFARDI, MATTIO.—A gilt frame glazed, containing a vase of flowers and other ornaments, made with gilded paper work and imitation pearls, &c., £6; do. with crucifix in centre, £5; do. with portrait of Queen Victoria, £6; one box, gilt papier maché, &c., imitation of filagree, £1 10s.; one saucer, gilt papier maché, £1 5s. Total, £18 15s.

**3** BARBIERI, COMMENDATORE M. A.—Mosaics set in gold.—1. Set of Roman mosaics, brooch, ear-rings, and bracelets, bordered with Lapis lazuli, Etruscan setting, £28; 2. Another set, £26; 3. Bracelet, with flowers and Roman inscription, £17; 4. Brooch and ear-rings, with cherubims, £14; 5. Do., with angels and cherubims after Raphael, £10; 6. Do., flowers on white ground, £9; 7. Do., view in Rome, £6; 8. Do., dove, Byzantine, 9. Do., Massioni, Egyptian, £6; 10. Gold stand on tray, with flowers in mosaic, £12; 11. Brooch, Baccanti Sompejana, with pearls, £6; 12. Do. with flowers on black ground, £5; 13. Small brooch with Pompeian figure on do., £4; 14. Do., with head of Bacchus on blue ground, £4; 15. Do., with cross on white ground, style of fifth century, £6; 16. Do., with Bacchus on white ground £4; 17. Do., with Egyptian scarabeus, £3; 18. Do., with colosseum, £4; 19. Do., with heads of cherubims on blue ground, £4; 20. Do., with flowers in malachite, £3; 21. Do., with Egyptian scarabeus and pearls, £3; 22. Do., with Bacchante and Edera, green leaves, £4; 23. Do., with cherubims, bordered with pearls, Byzantine, £4; 24. Do., with cross and green leaves, Byzantine, £3; 25. Do., with dove and star, and "Pax," with catacombs, £3; 26. Do., with roses and Byzantine decorations, £3; 27. Pair of solitaires, for

the wrist, with dove on dark ground, £4; 28. Pin with Bacchante, £4; 29. Do. on black ground, ornamented with pearls, £2; 30. Do., with the monogram for Christ on the Cross, £2; 31. Do., with head of cherubim, £3; 32. Mosaics for solitaire, unmounted, £3; 33. The Virgin and the Blessed Angels, do., £6; 34. The same, with two buttons with heads of cherubs, £8; 35. The Virgin, after Raphael, in oval, £3; 36. The same, after Cardellino. Total 237.

4 FABB, VINCENZO.—Pair of white silk boots, 18s.; pair do. shoes, with rosettes, 6s. 6d.; pair of bronze shoes, 5s.; pair of grey prunella boots, 12s. to £2 1s. 6d.

5 JABORE, ANTONIO.—Specimens of artificial flowers.

6 MARNO, FREDERICK.—Specimen of illumination in frame.

7 MELI, SIGNOR.—6 samples of leather tanned in Malta.

8 MICALLEP, SALVATORE, 82, *Strada Teatro*.—Articles in Maltese lace, viz.:—One black shawl, £21; 1 black skirt, £15; 1 black parasol cover, £5; 1 do., £2 10s.; 2 black head-dresses, £1 10s. each; 1 black neck-tie, 15s.; 1 do., 5s.; set cuffs and collar, 5s.; 1 black jacket, £5; 1 do., £4; 1 do., £3; 1 black canezou, £3 10s.; 3 white cotton counterpanes, at £5 each. Total value, £78 5s.

9 MUNNIBO, VINCENT, 103, *Strada Teatro*.—One white lace rotondo mantle, and 1 black lace do., each £13.—£26.

10 MUSCAT, P., 30, *Strada Reale*.—Articles of gold and silver jewellery filigree work. Pair silver filigree earrings, 6s. 6d.; do., 7s. 6d.—14s. Silver brooch, 6s. 9d.; silver comb, 19s. 6d.; brooch, 7s. 9d.—£1 14s. Silver candlestick, £1 18s. 6d.; card-case, £2 3s.—£4 1s. 6d. Card-case, £1 16s. 6d.; do., smaller, £1 12s. 6d.—£3 9s. Silver tray, old pattern, £5 15s. Malta cross, 13s. 6d.; do., 7s. 9d.; do., 6s.—£1 7s. 3d. Brooch, Malta cross, 6s. 6d.; do., two at 5s. 6d.—17s. 6d. Do., Roman cross, 6s. 6d.; do., flowers, 5s. 6d.; do., leaves pattern, 6s. 6d.—18s. 6d. Head dress, silver, £1 7s. 6d.; large tray, £8 10s.; two smaller, £2 6s. 6d. each.—£14 10s. 6d. Hair-pin, £1 7s. 9d.; brooch, half moon, 6s. 6d.—1 14s. 3d. Covered glass flowers, with silver filigree stand, £16 10s. Cameo brooch, silver filigree, 10s. 6d.; do., with gold setting, £2 18s. 6d.—£3 9s. Do., with gold Etruscan setting, £3 13s. 6d. Gold brooch, Byzantine mosaic, £3 4s. 6d. Set of gold shirt studs, Maltese cross, £1 1s. 6d. Ring, rose chain pattern, £1 1s. Ear-rings, gold filigree, 16s. 6d.; gold rose-chain necklet, with Maltese cross, £4 19s. 6d.—£5 16s. Ladies' gold-rose chain, £10 15s. Gentleman's do., £4 18s. 6d.—£15 18s. 6d. Total, £85 10s. 6d.

11 POLITI, ANTONIA ZAMMIT.—A specimen of embroidered white lace (not for sale); a piece of black lace, £3; an artificial pelerine of eider down, £1 5s.—£4 5s.

12 POLITI, CANON F. L.—Plate of filigree work, in gilt paper, £3; two figures of Grand Masters of Malta, £2; one do., Maltese Baroness, ancient costume, £1; one do., slave and child, £1; two do., Maltese costume, £1 4s. Total, £8 4s.

13 POLITI, MISS ZAMMIT.—A velvet cushion, richly embroidered in gold and silver, £15; a green do., embroidered in gold, £12. Total, £27.

## MAURITIUS.

### West Gallery.

1 WIEBE, C. & Co. *Labourdonnais Estate*.—Sugars, raw, partially claired, extra fine; made without animal charcoal.

2 BOUTON, Professor.—A collection of 55 specimens of medicinal plants, growing in Mauritius, and copies of his work, "*Les Plantes Medicinales de Maurice*."

3 BROUSSE, N.—*Pamplemousses*.—22 lbs. of vanilla.

4, 5 ROQUET BELLOQUET, E. *Schenfeld*.—Sugar as prepared for the Australian market; coffee.

6 BOUVET M. *Port Louis*.—Preserves; pate de pêches (peach); de goyaves (guava); d'ananas (pine apple); papayes cristallisées (papaya).

7 THE COMMITTEE.—Lentils; beans (*haricots blancs*); beans (*haricot pâles*) from Rodrigues Islands; pulse.

8 LANGLOIS, Madame E. B.—Mace and nutmegs.

9 GREENE, B.—A set of 4 photographs of the ascent of "Pieterboth mountain."

10 POURPINEL DE VALANCE, F.—12 bottles of the finest colonial liqueurs; noyau de bibasses; de pêches; ravenara simple; ravenara prix moyen; parfaite amour (cedrat); cedrat tombaya.

11 BOUVET, M. *Port Louis*.—Jellies: gelée d'ananas, de framboises, de mangues, de goyaves, pommes d'amour.

12 MOREY, Madame, *Port Louis*.—17 bottles of pickles; achardes legumes, palmistes, limons, raffinés.

13 BOUVET, M. *Port Louis*.—2 bottles of chillies preserved in vinegar.

14 MOREY, Madame.—2 bottles of tamarinds in syrup.

15 LECUDENEC, M. *Roche Bois*.—12 bottles of honey.

16 BOUTON, Prof.—35 kinds of fibres cultivated at Mauritius, or indigenous, prepared by Mr. J. Duncan.

17 ICERY, E. *La Gaicé Estate*.—3 boxes of different varieties of sugar.

18 LEVIEUX M. J. *Petite Riviere*.—58 lbs. of vanilla.

19 DUALMARD, M.—13 lbs. of manioc root powdered.

20 FURCY DE CHAZEL, M.—Down or hairy covering of the seeds of the *Sterculia fatida*.

21 LEBRUN, E.—Resin; caoutchouc gum from Baie de Vohemar, on the Eastern coast of Madagascar.

21A CANNONVILLE, Messrs. J.—Vanilla.

22 PITOT, Hon. H. *St. Aubin Estate*.—Samples of sugar.

23 CONSTANTIN & Co. *Benares Estate*.—Sugar.

24 HERCHENRODER, M. E.—Specimens of leather, tanned with indigenous and foreign barks, and by chemical process.

25 DIORE, M. J.—Various kinds of biscuits.

26 BERGICOURT, M.—Tobacco.

27 DESJARDINS, M.—Tobacco.

28 D'UNIENVILLE, M. *Savanna*.—Three carottes of tobacco.

29 BERGICOURT, M.—2,000 cigars.

30 SAPANY, M.—500 cigars of a superior quality, prepared with the leaves of tobacco imported from Covinghy.

31 THE COMMITTEE.—Specimens of vacoa bags, *Pandanus utilis*, from Mauritius, Seychelles, and Madagascar.

32 INDIAN ORPHANS, Government Asylum, Mauritius.—Specimens of ropes of various kinds, manufactured by the Orphans.

33 INDIAN ORPHANS, Government Asylum, Mauritius.—Specimens of rattan work, baskets, &c, manufactured by them.

34 NAGEON, Mdle.—Box made from the leaves of the double cocoa nut of the Seychelles.

35 INDIAN ORPHANS, Government Asylum.—Prepared fibres of the *Agave Americana*.

36 DESJARDINS, M. E.—Various kinds of cotton.

37 PITOT, M.—Various kinds of cotton.

38 PITOT, Hon. H.—Arrowroot.

39 ROSANGE, M.—Starch prepared from the root of the manioc.

40 AVON, M.—Meal prepared from the root of the manioc.

41 POULE, M.—Various kinds of pickles and chutneys.

## NATAL.

### North-west Gallery.

#### A Descriptive Account of this Colony,

By JOHN ROBINSON, F.R.G.S.,

Member of the Legislative Council, Editor of the "*Natal Mercury*," and Author of "*A Practical Guidebook*" to the Colony.

*Situation and Climate*.—The British Colony of Natal occupies the same parallel of latitude as Algeria, Queens-

land, Chili, and other countries similarly situated as regards fertility of soil and variety of resources. It is thirty degrees east of Greenwich, and thirty degrees south of the line, and has at present a seaboard of about 150 miles, overlooking the Indian ocean at a point of the African continent about 800 miles north eastward of the Cape. Being 390 miles south of the tropics, it is free from those protracted seasons of intense heat that are incidental to torrid latitudes while it also enjoys an immunity from the inconveniences and the evils of a low temperature. The climate of Natal is, on the whole, worthy of its reputation. Mild and congenial, it is neither too inclement nor too relaxing for the European system. The thermometer indicates a range of temperature from 38 to 96 degrees. The monthly mean during the winter season, from May to August, would range according to locality 60 to 67 deg. This period of the year is characterized by a clear bright sky, by a rainless atmosphere, by a keen bracing temperature before sunrise and after sunset, and by moderate warmth during the day. The Summer, or the "rainy season," may be said to last from October to March. At this time, especially in the month of February, the heat is much greater. Occasionally the thermometer will rise to 100 deg. in the shade, and very rarely indeed falls below 60, while it often ranges between 80 and 90. As a rule, the district near the shore is warmer than the uplands. The average mean temperature of the six hot and wet months for six years past has been 69·1, and of the six cold and dry months for the same period 60·7. The average highest reading for that time ranged from 87·8 to 91·5. Periods of extreme heat are not of long duration. On the shore a sea-breeze generally springs up after noontime, and renders the air pleasant. The English constitution does not find the colonial climate particularly inconvenient or injurious. On the contrary, Natalian residents invariably complain of the bitterness of a northern atmosphere, on revisiting the mother country after an experience of several years on the coast of South Eastern Africa.

Although the area of the colony, properly so-called, does not, as yet, exceed that of Scotland, it is, owing to the peculiarity of its physical conformation, endowed with the climates and the capabilities of many countries that are widely divergent in their topographical relations. The surface of the land rises from the sea-shore to the western boundary of the colony—formed by the great Drakenberg or Kahlamba range of mountains—in a series of terrace-like elevations. Thus, although the town of Pietermaritzburgh is only fifty miles from the coast, and does not appear to occupy a special altitude, it yet is 2,000 feet above the sea-level. This height is attained by low hill ranges which present a bold face sea-ward, but which have no corresponding descent on the landward side. In this way the surface gradually ascends until it reaches the limits of the colony, where its height above the level of the sea has increased to nearly 5,000 feet. It will thus be understood why it is that the atmosphere of the shore belt is more humid than that of the remoter districts, and why in the uplands the temperature of a much lower latitude is not frequently experienced during the Winter. It is necessary to state this interesting fact at the outset, as it sufficiently accounts for the unusually comprehensive range of Natal's natural products, and justifies the colonists in looking forward to rapid progress and steady prosperity in the future.

Pleasant as the dry mid-year months may be, the colonists rejoice when the heats of Summer arrive, accompanied as they are by periodical rains. After April very little rain falls until October, when the Spring showers are anticipated. As a general rule, wet weather never lasts longer than one or two days. On very rare occasions a south-east wind sets in from seaward and brings with it a fall of rain, extending, perhaps, over three or four days. After this exceptional occurrence the rivers will be more or less flooded, and some inconvenience may ensue. Thunder-storms are

very common during the hotter months. These electrical visitations usually take place in the evening, and though severe for the time being, soon pass away, after having effectually achieved their work of purifying and relieving the atmosphere.

As regards rainfall, Dr. Mann's observations taken at Maritzburgh during the six years from 1858 to 1864 show the following results:—

Average monthly fall, for each month of the wet season, . . . . .	6·038
Average fall for six Summer months, during six years, . . . . .	26·483
Entire fall for six Summer months—October, 1863 to March, 1864, . . . . .	36·229
Average monthly fall for each month of the dry season, . . . . .	0·350
Average fall for six Winter months, during six years, . . . . .	5·038
Entire fall for six Winter months of 1864, . . . . .	2·175
The mean total annual rainfall, . . . . .	30·079

—Rain fell on 119 days during 1862, but during the six Summer months of 1863-4, rain fell on 103 days; and during the six Winter months it fell on 26 days, being an average of 4½ days per month. There were 251 days on which no rain fell.

The other climatal peculiarities which may be briefly noticed are the occurrence of a few times during the year of sirocco-like "hot winds," which blow over the upland and midland districts, from the north-west, and are presumed to have originated in the far western deserts. These warm blasts are excessively disagreeable to the senses, but happily they vanish shortly after midday, and are hardly ever experienced near the coast. Heavy hail or ice-storms sometimes fall, and if they chance to visit a town or valley, may prove destructive to wall-plaster, fruit trees, and windows.

As regards the sanitary properties of the climate, it may be said that Natal is, on the whole, healthy. Dysentery, diarrhoea, and a certain type of intermittent fever, are so far the only diseases which can be considered prevalent. Ordinary care as to the avoidance of changes, and the regulation of diet, combined with the judicious use of simple remedies, will go far to prevent attacks of this sort. It is more than probable that vital statistics on Natal would compare favourably with those of other countries less tropical in their character. It has, of course, certain conditions of temperature that necessitate the exercise of habitual caution in certain special respects. Sudden alternations from heat to cold; local humidity in particular localities on the coast; heavy dews, or possible malaria, may produce or promote disease in systems which have not guarded themselves from the effects of such influences.

*History.*—With the exception of an unsuccessful attempt made by the Dutch to found a trading settlement there in 1721, little was heard of Natal until 1823, when Lieutenant Farewell formed a small band of colonists, who proceeded to the port now called Durban, and established a settlement there. This was simply a private venture, as the British government declined to take any part in the enterprise. These adventurers underwent many vicissitudes, and gathered around them a considerable band of aboriginal followers. They had to propitiate the favour of the great Zulu chieftain Chaka, whose reputation as a warrior and a conqueror was such that, to swear by his bones, is the most binding form of oath current among the natives. A gradual influx of refugees from the rapacity of their own rulers began, and this has been going on so rapidly ever since, that there is now a coloured population within the colony numbering nearly 200,000 souls. In 1835, the English settlers near the port had increased in number, although the original founders of the infant colony had all been removed either by death or departure; an American mission had been formed, and an English mission attempted, and, shortly afterwards, the emigration of the Dutch boers, from the Cape Colony, set into the

newly-developed land. It is unnecessary to glance at the events which resulted in the struggle between these latter occupants and the British Government; enough to state that in the year 1843 the territory of Natal was annexed to the Crown, as a dependency of the Cape Colony, and a corresponding reflux into the interior, of a great proportion of the Dutch farmers, immediately followed. Since that time the colony has gradually advanced in the path of progress. Peace has happily been maintained, and social order preserved. In 1856, the dependency was constituted a separate and independent colony, by royal charter, which also conferred upon the colonists the privileges of self-legislation, by the establishment of an elective legislative council.

**Physical Features.**—From the ravines of the Kahlamba mountains there flow the feeders of several minor streams, which, after intersecting and watering the greater part of the Natalian uplands, amalgamate their waters about sixty miles from the coast, and thence flow down to the ocean as a broad and rapid river, known as the Tugela. This stream, together with its most northerly tributary, forms the northern boundary of Natal. About 150 miles further south the colony is again limited by another river of less importance, called the Umzimkulu. Between these points, about twenty-four smaller rivers debouch into the sea, bearing with them the contributions of the rivolets and streams which traverse the surface of the land in every direction. Natal, therefore, in no shape partakes of the arid character that nature has stamped upon the western coast of this continent. On the contrary its contour is undulating; its vegetation is luxuriant; and the valleys which everywhere corrugate its surface are each the channel of running water. Unfortunately none of these rivers are navigable for any distance from their embouchures. Their rapid descent from the higher ground, and the shallowness of most of them, completely prevent their being employed for purposes of traffic.

The coastlands of Natal are thickly wooded. It is not here, however, that the timber forests of the colony are found. The scenery of this shore-belt is delightfully varied and picturesque. Its hills are darkened or mottled by the prevalent jungle bush, which, with its twisted and gnarled trees, its dense, evergreen, bright-leaved undergrowth, its massy flowering parasites, its curious ferns, its insect hosts, and winged multitudes, is a source of peculiar interest and attraction. Many of these bush plants are leguminous, and bear papilionaceous flowers. Although for the most part the larger trees found on the coast are too twisted, hollow, or narrow to be widely available for plank timber, yet they are all useful for certain specific purposes. The "Umzimbiti," or iron-wood tree whose stem is sometimes, eighteen inches wide, affords a very heavy and compact wood, used for axles, and other purposes requiring great strength. There are many other woods found upon the coast, of especial value to the wagonmaker and which may very probably be found valuable hereafter by the boatbuilder or the cabinetmaker. Several trees occur whose strange forms or peculiar qualities are new to the European eye. The prickly pear, the wild banana (*Strelitzia alba*) with its palm-like crest; the Euphorbia, in their multifarious forms, from diminutive plants to solemn candelabra-like trees, forty feet high and perhaps more; the grotesque cacti, which cling to the sides of river cliffs, and gigantic specimens of the aloe, twelve feet in height, are only a few of the vegetable novelties abounding in this region. There are also wild bushes which bear edible fruits: the *Amatungula*, or native plum (*Arduiana grandiflora*); the Cape gooseberry (*Physalis pubescens*); the kei apple (*Diospyrus*); a sort of wild cherry, and varieties of wild raspberry, are among the most prominent.

In certain localities of the uplands fine timber-yielding trees are formed. The more important are the yellow wood, a variety of yew (*Taxus elongata*), a soft compact wood, commonly employed throughout the colony for every purpose which does not entail exposure. The

tree attains very large proportions, and has mostly a bare stem. Sneezewood and stinkwood are both long-fibred tenacious woods, of good service to the cabinet-maker, and there are two species of ironwood extremely close-grained and dark hued. In addition to these there are many other descriptions, such as the red and white milkwoods, the white pear wood, the red ivory wood, and other varieties comparatively unknown as yet. The mimosa tribe is found in every part of the colony, and in many species. Its wide-spreading branches cover considerable tracts, but, so far, the tree has only been employed as fuel. Its bark is much in favour amongst tanners, and this may very possibly become a valuable export. A small sample of this bark, much used by the Bechuannas, near Lake N'gami, will be found in the Dublin Exhibition. For cabinetwork, vehicle-making, and shipbuilding, our colonial woods undoubtedly present special advantages. Medical plants and shrubs are numerous, but this is a department of botanical research wholly undeveloped. It is known that strychnine, senna, marsaparilla, and castor-oil are yielded by certain trees or bushes; it is known that the natives are cunning herbalists, and make good use of the treasures of the fields and forests around them, but no investigation has ascertained, and no classification defined, the extent or the nature of those treasures.

Beyond the coast belt of woodland the country opens out in wide, rolling undulations, sometimes swelling into massive grass clad hills, sometimes broken by bands of rugged, precipitous, and shattered declivities, and sometimes sinking into gentle basins or valleys. These are the pasture lands of the colony. Except in the valleys, and certain marked localities these uplands are covered by two varieties of grass, consisting either of a long, rank, and wiry variety of grass, or of much shorter, coarser, and redder herbage. Both are abundantly interspersed with wild flowers, representing the Irid, Amaryllid, and many other beautiful bulbous plants. The magnificent *Amaryllis belladonna*, or "Natal lily," with its crown of massive pink striped bells, may, perhaps, bear the palm of pre-eminence. In the spring month both the woodlands and the pasture lands of Natal are as gay with bloom and verdure as an English garden.

The geological formation of this portion of South-Eastern Africa is akin in its character to that of the surrounding territory; granite, sandstone, trap, and shale are the prevailing rocks. Granite rocks are found in every part of the colony; sometimes as loose boulders crowning the summit of a high hill; sometimes as large slab-masses protruding from the surface. Many of the lower elevations are of granite formation. A striking characteristic of South African hill scenery is the tabular shape assumed by many of the mountains. Huge masses of sandstone, perpendicularly faced on all sides, crown baseworks of granite, and present to the eye the table-topped hills so often remarked by early voyagers. The summits of these curious and isolated eminences often consist of wide areas of undulating ground, covered with rich pasture, and occasionally watered by springs of running water. Trap is very abundant throughout South-Eastern Africa. It is found thrusting itself alike through the granite and the sandstone, spreading out in rolling plains, or swelling up into bold hills. The "Silurian" sandstone of Natal contains no fossil remains of any importance, except the impress of vegetable forms found in some of the earlier formations. In the region bordering on the Southern boundary some interesting petrifications have been found near the coast. Shale is very plentiful indeed, and being easily obtained and readily worked, is largely used in building. It is a light, flaky stone, the hardened detritus of older formations, and requires protection from the sun to be permanently preserved.

Very little is known yet regarding the mineral resources of the colony. Surveys have been made, explorations attempted, and speculations indulged in; but beyond a few raw facts, no complete and comprehensive

classification has been attained. The natives have always been in the habit of using iron weapons, obtained by the rude smelting of surface ore. Ironstone is encountered, over the whole district, in the shape of small boulders, and though never developed, there is reason to believe that the country is largely endowed with this valuable metal. Coal, a resource of incalculable importance to a land well placed for the purposes of maritime traffic, has been found in such quantities, and of such quality, as to indicate its existence in an available form and to an adequate extent. The Natal Coal Company has secured valuable concessions from the government, with the view of constructing a line of railway to almost exhaustless coal fields that exist in the colony about 160 miles from the port. This coal is already largely used by the colonial smiths, who prefer it to the English coal for its heat-giving and clear-burning qualities. Plumbago is of frequent occurrence, and lead is also asserted by credible authorities, to be present. The discovery of copper has often been announced, but the discovery has never been followed up. Traces of silver have also been observed. Ten years ago, when the prospects of the colony were not cheering, owing to the successful competition of the Australian gold-fields, a large reward was offered by an influential body of colonists to the discoverer of gold in sufficient quantities, but the reward was never earned. The aspect of many parts of Natal is very similar to that of the Victorian gold fields. Quartz in some localities is singularly abundant, and mica is present in the beds of some of our rivers. Gold ornaments have been exhibited by natives, as the product of places in the interior, and very sanguine expectations have been hazarded in regard to the existence of the precious ore. Time, however, has yet to reveal whether Natal is to be another source of auriferous supply. It will thus be seen that the mineral possessions of this part of Africa remain entirely undefined and uncertain, and may prove in the future to be either much greater or much less than they are now presumed to be.

Twelve years ago Natal was the home of many wild animals which can now be only found in the remoter wilderness. The elephant, the lion, and the rhinoceros, had a habitat within the limits of the colony. Now, however, they, and most other varieties of fern have retreated before the inroads of hunters and settlers, not merely out of Natal, but even beyond Zululand, and the Orange Free State, into the jungles, and on the plains of regions where the sportsman and the wandering savage are the only human visitants. The magnificent horns, skins, and other trophies of the chase exhibited at Dublin are all from these districts, where comparatively boundless hunting fields afford ample scope for the trader and the sportsman, and whose stores of ivory, feathers, and skins, add largely to the natural exports of Natal. Brute life is principally represented by the antelope tribe, known locally by the generic name of "bucks." Of these there are many varieties, duiker-bucks, riet-bucks, rhe-bucks, oribis, blue-bucks, spring-bucks, bush-bucks, and bles-bucks, are the most common of the smaller sized species. Elands, hartebeests, wildebeests (gnu), quaggas, and zebras, are all of a much larger size, and are only found during the winter months in the country below the Kahlamba. Hippopotami, or sea-cows, are often encountered in marshy lakelets or reedy river-beds. Panthers, misnamed "tigers" by the colonists, occasionally demonstrate their existence by a raid in some farmer's cattle-yard or sheep-fold. Alligators, or more properly crocodiles, are far too numerous in some of our rivers, but they will doubtless disappear as population and traffic increase. Tiger-cats, hyenas, jackals, wild dogs, wild pigs, porcupines, ant-bears, hares, rock-rabbits, monkeys, and baboons, may be mentioned as the most common of Natalian quadrupeds. It must be understood that the only way in which any of these animals become offensive to European settlers is by occasional depredations among calves or poultry. There are residents of twelve years standing who have never

seen anything more offensive than a monkey or a mole. Snakes are numerous. The cobra, the puff-adder, and the mamba are the most obnoxious, but it is a rule that, unless trodden on or attacked, they never molest man.

The ornithology of Natal has not been the subject of any thorough scientific research. The collection of stuffed birds exhibited at South Kensington, in 1862, was a fair representation, and the admiration it evoked would be renewed on a personal experience of the bird-life which abounds in the jungle and the forest. Game birds are found in great variety. Foremost among these must be placed the paauw, or wild turkey, a sort of bustard, of large size and delightful flavour. The koran is another winged *specialité*, dear to the hearts of sportsmen; pheasants, quails, pigeons, guinea-fowl, partridges, and snipes are plentiful enough in the field or in the bush. Ducks are more choice in their localities. The long-legged tribes abound everywhere, either as storks, cranes, or pelicans. That devourer of snakes, the secretary-bird, the voracious locust-bird, the diminutive but noisy honey-bird, the big-headed toucan, the long-tailed kaffir-finch, the gay lori, the brilliant king-fisher, the African canary—these are only a few of the Natalian birds. There are also birds of a fiercer disposition. Vultures hang in wait for carrion; hawks threaten your broods; kites and owls are common; the golden eagle and the sea eagle haunt the mountains and the shore; the ubiquitous crow is superabundant, and has here assumed a white collar round its neck. Varied in plumage, eccentric in their notes, strange in shape, and peculiar in habit, the colonial birds supply an interesting sphere of study to the naturalist.

Entomology is richly illustrated by innumerable tribes and divisions. *Orthopterous* or fan-winged insects have notable representatives in immense locusts, multitudinous grasshoppers, twig-shaped *phasmids*, grotesque mantises; in countless beetles, crickets, and cicadae. Butterflies of every hue suffuse the Summer air. Fire-flies illuminate every rivulet and marsh. Ants, from the infinitesimal red emmet to the destructive termite, are one of the most serious pests inflicted on the colony, but the insect known locally as the tick (*ixodes*) is universally held to be the most offensive to human beings and to quadrupeds. There is one almost invisible variety, which has a passion for burrowing into and irritating the skin of man, and there is a larger species which attacks cattle in such numbers and with such rapacity as to be a positive injury and nuisance. This obnoxious little creature is principally confined to the coast lands. Mosquitoes are also becoming unpleasantly common in the towns and in low-lying localities.

Thus much in regard to the physical features and natural resources of Natal. This rapid *resumé*, inadequate though it be, will have sufficiently shown that every branch of the three great kingdoms of nature is, in greater or lesser degree, represented. The soil is varied and fertile; the rocks, though palæontologically barren, are in all probability commercially valuable; the vegetation is rich, luxuriant, and novel; the climate is agreeable, and the fecundity of brute life is only a pledge of natural abundance and an earnest of future wealth. To the savant, the naturalist, or the speculator in search of new fields of enterprise, this part of South-Eastern Africa may be commended as a generous region of research, or as hopeful ground for investment.

*Natural Capabilities.*—In describing the commercial products of so rich a country, great brevity will be requisite. Fifteen years ago Natal had no exportable products to send her creditors. Her capacities at that time were based on supposition, and subject to uncertainty. Her coast lands were not only wholly uncultivated, but were a *terra incognita* to the colonists themselves. Her position, then, in the year 1850, was identical with that of Britain in Druidical times, or of North America in the days of Raleigh. When the first World's Fair was held, our colony had not merged from its helpless babyhood; it had failed so far to find its feet; it had neither a name nor a voice of its own.

A cycle of eleven years then elapsed; another Exhibition opens its doors, and, instead of the few karosses, and the prodigious ox-horns that represented our resources in 1851, we had more than 250 specimens, surrounded by pictorial illustrations of the colony, occupying a court of their own, which was furnished entirely by local artificers and local industry, and which was the only appearance made by any of the South African Colonies, or States. The collection now exhibited, though hurriedly got together, owing to the lack of due notice, will serve to show that the industrial and natural resources of the colony are as numerous and substantial as ever.

It has already been remarked that the rapid fall in the elevation of the ground which ensues between the mountain boundary of the colony on the west, and the sea coast, results in a wide and unusual diversity of products. Thus, *par exemple*, on the littoral or coast belt, sugar, arrowroot, coffee, ginger, and other tropical plants are grown and manufactured. Seventy-five mills, mostly driven by steam power, are employed in manufacturing the *eleven thousand acres* of cane scattered in different plantations along the shore. The quality of Natal grown sugar is equal to that of Mauritius. In the Exhibition will be found one sample of sugar made in the ordinary manner, without the aid of vacuum pans, and which, for size of grain and excellence of colour, is worthy of especial attention. There is yet an immense extent of country capable of being devoted to sugar culture by men possessing energy and capital. There is no question about the success of this branch of agricultural enterprise. It has been produced with remunerative results alike by men of moderate means and by the possessors of capital. The yield per acre is fully equal to that obtained in the Mauritius, where the application of manure, not yet known in Natal, is an indispensable expedient.

The coffee grown in Natal has been declared on various occasions, by competent judges, to be of first-rate quality. So favourable have been the results realized by the oldest growers, that great attention is being given to the culture of coffee, and many new plantations are being formed. Last year twenty-five acres yielded fourteen tons of fine berries. It is believed that the shrub will thrive well in the upper districts, and some experimental plantations are being formed there. Excellent coffee has been grown so far inland as the Trans-Vaal Republic, 450 miles to the north-west of Durban. Tea is a product of very recent introduction. Almost the first sample prepared was exhibited in 1862, and received private commendation. In soil and climate much similarity exists between Natal and China. Arrowroot has given occupation to many agriculturists of small means, and were the home market more extensive and encouraging, any quantity might be produced. The article manufactured might almost be classed with Bermudian. Indigo is indigenous to the soil. Its growth was attempted on a large scale some years ago, but doubt still exists whether the climate will not interfere with the successful manufacture of this delicate but important staple. Ginger and turmeric are both grown for private use. Tobacco is found to thrive all over the colony. A coarse variety of the plant has long been grown by the natives of South Africa, who are inveterate smokers and snuff-takers, and cultivation is found to supply a leaf of excellent quality. The returns are excellent, and the quality of the leaf produced will be best ascertained by a reference to the tobacco and cigars now exhibited. In the midlands and uplands of the colony agriculture assumes a more European character. Indian corn, or maize, and oats are grown largely over the whole district, but in these higher localities wheat, barley, pulse, and other descriptions of grain are cultivated. Wheat, I should state, is by no means a common or hardy product, and has not been so successfully acclimatized as other sorts of corn. Vegetables, both in European and tropical forms, are readily grown. Pumpkins, melons,

squashes, yams, and sweet potatoes are found side by side with beans, peas, and other kitchen favourites of northern lands. Fruit has an equally wide range. From the pine-apple and the papaw to the apple and the peach, there are few varieties of fruit that cannot be luxuriantly grown. Some of the most familiar English plants, the gooseberry, strawberry, and currant, are perhaps the exceptions.

Stock farming has been impeded by the devastations of pleuro-pneumonia amongst the cattle, and by the periodical outbreak of a fatal epidemic amongst horses. The first scourge has been partly counteracted by inoculation and seems dying out, after having swept South Africa. The latter is only an occasional, and not a regularly recurrent evil. Imported blood, in the shape of bulls, cows, and thorough-bred stock horses, is constantly introduced from England and the Continent, and is effecting a vast improvement in the character of local stock. Sheep farming is being very generally followed by a large number of English farmers in the uplands. Some of the diseases common to sheep are encountered, and at times prove very fatal, but as stock gets acclimatized, it is believed that these drawbacks will be overcome, and large flocks are often introduced from the Cape Colony. In 1853, the number of sheep was less than 40,000; in 1864 it was 200,000. Some fine samples of wool will be found exhibited, and rams and ewes of the best European breeds are often imported. Formerly Natal was known as a land overrun with cattle, and there is every reason to anticipate that the many millions of acres of her pasture lands will continue to feed the flocks and herds of a pastoral people.

Fibre-yielding plants have a genial home in Natal. A coarse description of flax is a native of the country. Many of the wild grasses and shrubs afford textile fibres of great fineness, silkiness and tenacity. The Zulus make string and rope from a hemp plant that grows in spontaneous abundance about their kraals. Here, however, great ignorance of local resources prevails. Several specimens of fibre obtained from the aloë, the pine-apple, and native shrubs and grasses are in the Exhibition, and well worth examination. There are also some novelties from N'gami, made up into rope, cord, and twine by the natives there, and giving proof of great strength and tenacity. More is known about the common fibre staples of commerce. Silk can be produced to any extent, as the mulberry grows with remarkable rapidity, and the worms are specially prolific. It is to cotton, however, that the colonists look most hopefully under this head. Twelve years ago several tons of this staple were grown and shipped, but the enterprise has not, until quite recently, been prosecuted; now the natives are being encouraged by government to cultivate the plant on their own account, and several bales of fair average quality have been produced in this way. Many European colonists are turning their attention to cotton cultivation as a remunerative occupation. It has been ascertained that sugar and cotton can be advantageously grown together, as the busy season of one product is the idle season of the other, and thus the all-important consideration of labour is economically met. The cotton exhibited by the Natal Cotton Plantation Company is from the first of this year's pick, and has been pronounced to be equal to the finest ever brought into Liverpool. During the last Summer a small fly, believed to be the *aphis*, has appeared, and been very destructive, but it only appears at long intervals. The company have nearly a thousand acres under cultivation.

This brief sketch of our natural resources, inadequate though it be, will suffice to show how singularly favoured the land is in the means of wealth; how varied are the openings presented to the man of energy and enterprise; how wide and hopeful is this field of action to those who have capital to invest or labour to expend.

*Commerce—Imports—Revenue.*—The extent and direction taken by the commerce of a country are of course very largely governed by the maritime advantages it enjoys. It may here be stated, therefore, that the Port

of Natal is the only real harbour, worth the name, that occurs throughout 700 miles of seaboard. Between Algoa Bay and Delagoa Bay there is but one secure and accessible haven, and that is our beautiful land-locked bay. A sandbar at the entrance has hitherto prevented the ingress of vessels of more than 800 tons burthen, but, the colony having agreed to the negotiation of a loan for the special purpose, two breakwaters, designed by Mr. J. Abernethy, C.E., and constructed on the model of one at Blyth, are now being run out. Natal, from its relative position, must be not only the gateway through which shall pour the produce and the supplies of all South-Eastern Africa, but the natural calling place for many homeward-bound or distressed ships. There is a steam-tug attached to the port, and a railway, the first opened in South Africa, connects the harbour with the town of Durban. A patent slip is also likely to be erected. A lighthouse, that will be visible for a distance of thirty miles, is also being built at the expense of the colony. Wharfs are also being erected, and other landing facilities will be provided. Some very handsome iron bridges over rivers in the colony have lately been opened for traffic.

The Colonial Legislature having granted, under certain conditions, a guarantee of 6 per cent., and large concessions of land and mining rights, to the Natal Central Railway and Coal Mining Companies, we may hope before long to see the great trunk line of railway begun. It is bound to be finished before 1875, and will confer upon the colony inappreciable benefits, in opening it up from end to end; in making available the coal and mineral resources of the soil; in bringing to the port all the trade of the vast interior; and in diffusing among the population all the social influences proverbially exerted by railways. The enterprising residents and planters of the northern coast districts have resolved to have a coast line immediately carried out, under their own local guarantee, and the surveys are already being proceeded with.

In order that the development of productive industry may be more fully understood, I append a table, giving a bird's-eye view of our principal exports during the past ten years. It is enough to say that the trade of the colony is trebling itself every five years.

	Wool		Ivory		Butter		Hides		Arrowroot	
	£	s	£	s	£	s	£	s	£	s
1852	2,026	10	6,274	10	6,700	13	1,196	10	—	—
1853	3,450	0	8,404	0	5,506	0	902	14	31	12
1854	3,366	0	11,088	10	8,444	10	2,041	0	97	10
1855	8,331	10	13,594	10	8,915	2	3,201	6	999	7
1856	7,325	10	13,715	0	7,391	0	11,368	10	1,826	10
1857	9,887	10	18,170	0	12,142	8	22,365	2	3,135	18
1858	11,360	0	31,754	0	15,685	0	16,887	0	5,464	0
1859	28,088	0	17,618	0	17,640	0	11,339	0	13,336	0
1860	27,790	10	21,064	0	19,306	0	15,920	16	6,680	1
1861	32,888	0	22,825	0	14,582	0	9,793	8	4,684	11
1862	38,432	0	27,059	0	11,381	0	5,932	0	1,547	0
1863	48,325	0	40,736	0	8,204	0	6,464	0	2,801	0
1864	51,590	0	26,254	0	5,650	0	3,569	0	2,848	0

	Wool		Sugar		Meat		Grain		Feathers	
	£	s	£	s	£	s	£	s	£	s
1852	—	—	—	—	—	—	—	—	—	—
1853	1,959	15	—	—	651	17	—	—	—	—
1854	3,509	0	2	0	298	0	—	—	—	—
1855	1,705	4	19	5	3,309	16	—	—	—	—
1856	691	6	483	16	5,468	15	—	—	—	—
1857	885	1	2,008	15	860	10	—	—	—	—
1858	1,361	0	3,067	0	—	—	—	—	510	0
1859	298	0	8,368	0	299	0	2,467	0	391	0
1860	209	0	32,005	16	96	0	1,030	0	465	0
1861	—	—	19,415	16	—	—	190	0	564	0
1862	—	—	21,178	0	—	—	1,905	0	2,510	0
1863	—	—	26,133	0	—	—	8,721	0	7,255	0
1864	—	—	94,372	0	—	—	844	0	6,972	0

The progress of shipping and trade will be best under-

stood by the Customs returns for past years. [It will be seen that trade has doubled itself in the last five years, and that the exports are nearly five times greater than they were ten years ago.]

The commerce of the colony is carried on by wholesale importers and retail storekeepers. Commodious warehouses and well-appointed shops are numerous in the two principal towns. Six banks—three of which are local companies, one a private establishment, and the two last home branches—absorb the financial operations of the community. Like all other colonies, Natal suffers from an insufficient currency. The development of enterprise in a new country is in advance of its available capital, and money commands twelve per cent. interest on the best security. A too diffuse credit system is the greatest bane we have, but it is hoped, as wealth and population multiplies, that this evil—a necessary condition of colonial existence—will be remedied. A Chamber of Commerce has been established some years, and its functions are being usefully employed.

The commercial relations of the colony are somewhat extensive. In addition to the internal requirements of the European settlers, there is a large Zulu population to supply with beads, blankets, hoes, and other nick-nacks. There is also a considerable trade carried on with powerful tribes on the northern borders by itinerant traders, some of whom go in ox-wagons, while others march afoot, carrying their wares in packs borne upon the shoulders of peripatetic natives. Both these classes pass from kraal to kraal until the stock of goods is sold, and cattle obtained in exchange. A strange wild life is that of these Zulu traders, something akin to that of the North-American trapper, as immortalized by Irving. Single-handed, and all but unarmed, they wander into the midst of barbarous tribes with whom warfare is a habit, and massacre a common occurrence, and yet, so great is the prestige of their colour and race, that I can cite no instance of one of them being maltreated. Such is the moral influence of national integrity, humanity, and power.

Beyond Natal, extending westward and northward, are two large free republics, each being many times larger than the colony, principally occupied by the descendants of the Dutch Boers, whose exodus from the Cape Colony thirty years since I have already referred to. That lying nearest to Natal is the Orange Free State, formerly, when under British rule, known as the Sovereignty, and offering boundless capabilities upon its vast prairie plains for sheep pasturage. The state north of this is called the South African (or Trans-Vaal) Republic, with a more purely Dutch population, and a diversified range of resources. With these communities the mercantile houses of Natal carry on a large trade by means of branch establishments, some of which have proved the nuclei of prosperous townships. To a country having such wide connexions, the matter of transport is of vital importance. So far waggons, drawn by long teams of oxen, have carried on the traffic, and for some time to come they will be the only available medium. Roads, however, are continually being made and improved, and bridges erected. The expenditure in 1864, under this head, was nearly £20,000.

If the revenue returns of a country are a sure index of its progress, Natal may show hers to the world with justifiable confidence. Beyond postal charges, customs duties, and a few stamp payments, there are no direct taxes levied, and yet, during the three years elapsing from December, 1858, the public receipts were trebled. In 1855 the revenue was little short of £170,000. In 1859 it was only £50,000.

I can but give a very hurried glance at the social condition of the colony. In the absence of any reliable census, the white population may be assessed at about 16,000. Of these 3,000 are resident in the seaport town of Durban, and 3,500 in the city of Pietermaritzburg. Several villages are scattered through the country districts. Their modes of life, though rude in some

respects, are more polished than in many other similarly situated communities. Never having been subject to a rush of emigration, the class of British settlers is of a superior order and a higher degree of intelligence than is found in dependencies whose rate of progress has, owing to special causes, been greater. On this point I may quote the words of His Excellency Sir George Grey, than whom no one is better qualified to give an opinion:—"Among those who have arrived from Great Britain is included a considerable number of English gentlemen of good education, of great intelligence, and who have had much experience in Natal. With a considerable acquaintance with the British colonies, I should say that in the character of its European population, in proportion to their total number, Natal might, with no disadvantage, be compared with any other colony. It was partly from the intelligence and prudence, with which I cannot but think that its inhabitants of European descent are peculiarly distinguished, that their requests to have some share in legislating for their country were of so modest and simple a character."

This flattering testimony will serve to explain why so much activity and interest is displayed in social movements. The institutions of the colony would require more space for detailed description than can here be given them. There are several agricultural societies that hold annual shows, and stimulate enterprise by the distribution of prizes. At Durban there are large botanical gardens, where the vegetable products of the soil may be learned at a glance. There are literary institutions and book clubs, building and investment societies, young men's improvement associations, and other kindred organizations. Education is vigorously sustained and promoted under the able superintendence of Dr. Mann, F.R.A.S. Sixty schools are established, and in receipt of pecuniary aid from the public exchequer, and fourteen private seminaries are under government inspection. In these 1,400 scholars acquire the rudiments of practical knowledge. The Corporations of Durban and Maritzburg have endowed, with £5,000 each, two colleges that will shortly be in action, and the local government contributes an equal amount. By such instrumentalities the colonists hope to avoid the retrogressive tendencies incidental to their condition.

The claims of religion and liberty are recognised. Almost every religious denomination is represented in either of the towns by a substantial edifice for the use of its worshippers. The Church of England and Independents, Presbyterians, Wesleyans, and Baptists, have all a distinct organization. A Roman Catholic Church, under the charge of a French bishop, has been established many years. In the country districts, in addition to the very numerous mission establishments, there are many churches and chapels.

The Zulu Kafirs, of whom it is impossible to give more than a passing notice, number in Natal about 190,000 souls. They are mostly refugees from the neighbouring territories, where the tyranny of native chiefs affords no protection to the subject. Owing to this fact, our colonial population is wholly fragmentary and disorganized in its composition. There is no cohesion among its parts, and this want of union, together with the tribal jealousies which prevail, is an effectual bar to any hostile movement. Throughout the Kafir war of 1852-3, and ever since, peace has been maintained unbroken, and there is no reason to look forward apprehensively to the future. Twenty years of peace have matured a generation of Zulus with whom bloodshed is a tradition rather than a fact. They know little of war, except by hearsay or by dim childish recollection. The pacific experiences of childhood and youth have blunted the warlike instinct and effaced the sanguinary reminiscence. Unlike the natives of New Zealand, the Kafirs of the Cape frontier, or the red Indians of America, a cycle of domestic servitude and political order has tended to deaden, if not to obliterate, the worst passions of the savage nature. Like all other barbarians, the Zulus are a mixture of good and bad.

They are light-hearted, active, deferential to their superiors, and attached to those who treat them well. But they are also avaricious, indolent, passionate, deceitful, and sensual. It is very probable that under firm, just, and consistent treatment their better natures may be made to predominate. They know how to obey a stern master, who has, at the same time, won their confidence and respect; they know also how to presume upon well-meant though ill-judged indulgence and familiarity. Any new license granted them is taken advantage of and abused. Naturally independent, they will, if allowed, become personally insolent. The Zulu is eminently susceptible of civilization, but he is equally open to the injurious impressions left by vicious example and criminal association; he may as readily be educated to roguery as to probity. It cannot be said that he has the instinct of plunder normally developed in his breast under any but special circumstances. It is only when he has learnt the vices of civilization that his natural cupidity is aroused, and, contaminated by contact with a superior race, he essays to follow in its footsteps. In illustration, I may allude to the unpalatable fact that a colonist prefers, as a servant, a raw Kafir from his kraal to a "civilized Kafir," having found by experience that the latter is too often the greater scamp of the two. It is doubtful whether cotton will, immediately at any rate, be largely grown on their own account by the natives. They are very crude agriculturists, and a long process of initiation will have to precede the cultivation of the plant in sufficient quality. They are averse, moreover, to systematic industry; they like to cultivate their own hillside patches in their own capricious and irregular way; they rarely replant the same piece of ground for successive seasons, and are utterly unused as yet to any rule or routine whatever in the matter of agriculture, living as their fathers lived, and as they would fain still live, on the produce of scattered fields roughly hood up by their slave wives and marketable daughters. It is one of the anomalies of native government that in a free British colony, woman, the dearly-prized helpmeet of the European, is, according to the laws of our colonial population, a chattel; and on reaching a marriageable age, is disposed of by her father, wholly irrespective of her own feelings in the matter, to the man who offers for her person the highest number of fatted cows.

The number of natives that enter service for different periods during the year has been reckoned at 20,000. This is but a small proportion of the native population, and the evoking of more labour-power from this—the proper element—is, and ever has been, a fruitful topic of local discussion and legislation. Five years ago East Indian Coolies were first imported, and are found very useful. About 5,000 of these people are already in the colony, and the government has arranged for the introduction of two or three thousand yearly, on terms that are easy for employers. Coolie labour has been the solution of tropical culture in Natal. I hope that improved government, more thorough control, and the gradual adoption of European ideas and habits, necessarily resulting from longer contact, will, in course of time, render the Zulu Kafirs in Natal a working and productive element in the community.

In no part of the world are missionary operations more extensively prosecuted than in Natal. Every creed and country of Christian Europe has planted a station in some locality or other. The Americans were the first in the field, and are the most numerous. Hospitals are founded for the use of the natives, and every encouragement afforded to all movements tending to advance the native morally.

The colonists know that their own prospects are intimately involved in the social elevation of the aborigines around them, and, whatever may have been said to the contrary, are most anxious to see the native assume the duties and responsibilities of a civilized man. In saying this I only give expression to the sense of the whole colony.

*Government.—Defences—Loyalty.*—Politically speaking, Natal is better off than many colonies of her age and standing. She has at the head of affairs a Governor, paid by the colony, though appointed by the crown. With him are associated several heads of departments and public servants, also nominated from home, who form an executive council. Then there is a legislative council, and assembly composed of twelve elective and four official members. The first named are chosen for a term of four years, by the colonists, acting on a very liberal franchise. This assembly deliberates upon and passes the laws of the land, and, though possessing the power of rejecting any measure, exercises no executive control whatever, and does not influence by its decisions the administrations of government. The plan is considered defective in this respect, and will probably be remodelled so as to admit a modification of the responsible element.

The bench is represented by a supreme court of three judges, and by divisional courts under the jurisdiction of magistrates. When the colony was annexed to the Cape, Roman Dutch law was proclaimed, and is still the common law. Cases between natives are adjudged according to Kafir law, a rather complex variety of *lex non scripta*. The bar is respectably filled. The press holds a creditable position, being represented by the *Natal Mercury*, published five times a week, by the *Natal Witness*, published twice a week, and a new weekly paper. Pamphlets and books are occasionally issued.

When the question of colonial defence is being so earnestly discussed in English circles, it is pleasant to have to show that one colony, at least, is doing what it can to relieve the mother country of any superfluous burden. While Natal continues the frontier of British possessions in South Africa; while the numerical disproportion between its white and black population remains so great; while the colonists are, as at present, allowed no voice whatever in the management or government of the colonial races, with whose interests they are so closely identified, the imperial government is, and will be, bound to afford a considerable measure of military protection. Hence the garrison that is stationed in the colony cannot, with any show of justice, or with a regard to prudence, be interfered with. But the colonists are far from idle, although under the sheltering wing of the mother country. A liberal allowance is voted annually out of the colonial treasury towards the maintenance of the military staff. A mounted police force is being formed at local cost, and this body will prove an invaluable protective agency. Volunteer corps are in active existence in every district, and rifle associations are popular institutions. The expenditure incurred by Great Britain for the military protection of the colony—and no other charge is incurred on our account—is somewhat less than it used to be, and last year it was £37,749. The amount contributed by the colony towards its defence will this year be, at the least £14,000. About 650 volunteers are under arms, and a Colonial Defence Bill is to be passed, making every adult male colonist more or less liable. It cannot be said of Natalians that they shrink from incurring the colonial responsibilities of self-defence, although the privileges of self-government are exercised to a very limited extent indeed. I place especial stress upon this matter, because of the general misconception that prevails in regard to the colonists' aims and intentions, and because I wish that the real *verre* of colonization could be more thoroughly understood by my own countrymen. For who is the colonist, and to what do his labours tend? British in birth, thought, and instinct, he severs old ties, and unites his fortune and his family to exile and privation, not merely for the promotion of his personal interests, nor yet to retrieve a lost position, to restore a shattered fortune, or to advance his social status. He has a wider sphere of usefulness than the mere circle of his own concerns. He is, moreover, involuntarily assisting to carry out

that world-wide movement by which Great Britain is being girdled by new nations and states, and all the benefits of free commerce and free government diffused over the globe. It is this which I humbly conceive to be such an honourable feature in the colonist's position. It may be seen evolving its practical results in the happiest modes, in a wider scope for public energy, in the enlargement of opportunities, in a loss of those more repressive class restrictions by which, in old communities, ability is often stifled and useful effort checked. I have known intelligent working men take part in public movements, and hold posts of public responsibility, not through any overthrow of wise class distinctions—for in social life these boundaries, even in a colony are still maintained—but simply through their reputation for intelligence and good sense, and through a conviction that their department in those capacities would bring honour to themselves, and benefit to their fellow-colonists. The colonist's work then being one of such present utility and future import, it seems strange that his interests should be treated so carelessly and his desires so often misconstrued. He has not, as seems frequently imagined, alienated all claim upon imperial regards, lost all loyal sentiments, and patriotic aspirations.

I must now close this imperfect sketch of a valuable dependency. The future of Natal is bright with hope, for capital and population are flowing towards it with a steady pertinacity that augurs well for its continuance. In fifteen years the colony has emerged from a state of barbarism to one of comparative civilization, and during that period we have witnessed the reclamation of tens of thousands of uncultured acres, and the upspringing, in the remotest parts of the colony, of incipient villages and substantial farmsteads. There is every probability that the rich wastes of Zululand on the north will before long be annexed to the colony, while the fat pastures and vast forests of Nomansland on the south have already extended our territorial limits by two or three million acres. It would be easy to point out how great a future is opening to the several states in South Africa, for in addition to the Cape Colony and Natal, to the Orange Free State, and the South African Republic, further even yet in the luxuriant jungle lands and savannas of the north, the English trader is indomitably pressing his way toward the equator, laying bare to the growing enterprise of a commercial age territories that have been hitherto falsely regarded as hopelessly sterile and desolate. It needs little prescience to foresee that this immense range of territories, comprising, as it does, six established colonies or republics, each having independent resources, individual interests, and separate responsibility, shall yet be known as the South African Confederacy, the free, and let us hope, the concordant Arcadia of the Southern world.

*Natal at the Dublin Exhibition.\**—When about two months ago we received Mr. Simmonds' letter asking our co-operation in securing some representation of Natal at the Dublin Exhibition, we hardly ventured to hope that it was possible within such narrow limits of time to accomplish anything worthy of the name which the colony has acquired. Thanks, however, to the co-operation and active interest of many enthusiastic friends, our fullest hopes have been more than realised, and our fears have been put to flight. The collection, though not nearly so complete as it would and might have been had longer notice been given, is, at any rate, enough to show how varied and interesting are the many resources of this part of South Africa. Although it would have been very desirable to have had the different specimens more effectively prepared and arranged, and although the season has not been favourable to the acquisition of certain samples of local produce which mature at other times of the year, yet under the

\* From the *Natal Mercury* of March 4, 1865.

unfavourable circumstances of the case, the articles contributed and sent, are far more numerous and representative than we had any right to expect. They will serve very well to show the multitudes of visitors who will flock to Dublin in May next, much of what we can produce, though not all that it would be possible to exhibit, were there time to do it.

We now proceed to describe more particularly the articles that have been forwarded. First comes the interesting collection so opportunely contributed by Mr. Barry. That gentleman returned from his long and devious trip across the continent in the nick of time, and some of the curiosities which he has gathered together during his journeying are new and rare. These articles are very illustrative of domestic life among the Bechuana tribes of the interior, and especially so of the people living around Lake N'gami. We doubt whether such a gigantic pair of bullock horns has ever been submitted to British eyes, as that presented to Mr. Barry by Lechulatabe, Chief of the Batoana. They are certainly second only to the monster pair in the first International Exhibition. Several pairs of rare buck-horns are also contributed by Mr. Gifford, Mr. Baker, and Mr. Topham. The gemsbok horns, sent by the first of these gentlemen, are, from their size, very interesting. Perhaps nothing can be more suggestive of far-off scenes in the desert than these trophies of the African chase—the result of that adventurous spirit that has carried the English name, and the prestige of English prowess, into all the out-of-the-way places of the world. To the same class belong the skins of various antelopes and animals. To this department contributions have been received from Mr. Barry, Mr. Topham, and Mr. Horwood, whose two lion skins are noteworthy on account of their size. One is that of a black-maned lion, curious from its comparative rarity. This came from Zululand. Mr. Barry's poisoned arrows are the work of men almost as savage as the beasts that have yielded these skins and horns. They belonged to Bushmen, and are made of dwarf reeds pointed with bone spines, which are thickly covered with the deadly poison. Some of this in a crude state will be found on another stick. It is obtained from a small beetle which infests a tree of the Mimoso tribe. The fire sticks found in the same sheath as the arrows are the roughest mode of ignition known. The upper stick has to be twisted in its charred socket for about ten minutes before the welcome sparks are created. Some caps and head-dresses made of feathers and skins, and worn by the Bechuana near the Great Lake, show how the barbaric ideas of costume advance as we go northward. They are principally worn on frosty nights—for in the winter months of the mid year the cold around the marshy borders of the lake is severe. Among other domestic accessories picked up by Mr. Barry are some rattles, made of large seed pods; fans formed from the tails of golden jackals, and which are also used for the purposes to which pocket-handkerchiefs are generally applied; some spoons and ladles, cunningly carved in twisted shapes, from solid pieces of wood. There are also some articles in this part of the collection valuable in a commercial sense. The fibres are very fully represented, both in their raw state, and in various kinds of twine, cord, and thick rope, made and used by the natives round the Botlletie river. These fibres are mostly obtained from different varieties of marsh grass, and the rope exhibited has been employed in the trapping of elephants and the capture of hippopotami. A hundred yards of very strong fishing netting, as used in the waters of N'gami, show how large and valuable are the fibre resources of all Southern Africa. The tribe from which these specimens were got is the Bajeye or Bakoba. Reference should be made to the large earthenware jars, which, as superior specimens of native pottery, well deserve inspection. In this lot will be found a war knife, with an oddly-carved shaft. This comes from a tribe living to the south of the Zambesi, and never yet visited by a white man. It has doubtless seen a good deal of service, and taken a good many lives.

Perhaps the most grotesque object is the rudely carved elephant. We doubt whether a more original or primitive specimen of sculpture will be found within the Exhibition. Two long wooden paddles will serve to give a fair notion of how navigation is conducted on the Lake. These are the principal items in Mr. Barry's contribution, which is likely to be the best assortment of African curiosities in the Exhibition.

There are, however, other more local representatives of native industry. Mr. Topham's valuable collection, as will be seen from the subjoined list, comprises the entire range of Zulu Kafir economy. Those hard, grim looking logs of stained wood, are the pillows and stools which form almost the only furniture in the native's hive-like hut. Those little snuff-spoons, with their long prongs for insertion into the woolly wig adorning the manly brows of the savage, are no mere ornament, but, in concert with the snuff-boxes, made out of small gourds and calabashes, are in constant use every hour of the day. Nor is the office of the stone pipe a sinecure. This perhaps represents the most primitive form of narghileh. The whole apparatus may be seen further on. Seated in a circle, this calumet is passed from hand to hand, until the enchanted smokers subside into a wakeful stupor, caused by the strong fumes of the *dacca* or native hemp, whose smoke is inhaled through the water at the bottom of the cow horn. Some interest may be excited by the monuments of savage warfare—the spears, clubs, and shields—which are happily now, under a benign British rule, playthings, or mementoes of a darker past. Some idea of native aptitudes for mat-making and basket-work will be gathered from the specimens shown. Mark, also, Mr. Horwood's mat—as fine in its workmanship as ordinary Indian matting, and fit for use in any room. That our natives are not devoid of the artistic quality, a glance at some pieces of bead-work will show. Since it became compulsory on natives to enter the limits of townships clothed, the demand for beads has not been so great. Fashions regarding them vary very much. Sometimes large red ones will be in vogue, at other times small speckled ones will be all the rage. It is at their kraals, however, on state wedding occasions, that the Zulus may be seen to the greatest advantage in their panoply of beads, feathers, skins, and other savage finery. There is also a bundle of Amazosa assegais, and a very interesting Bushman's spade, sent by his Excellency Col. Maclean. The former are as suggestive in their way as the spears displayed in the Tower, while the last, it must be remembered, is the industrial handiwork of a race which ranks lowest in the scale of humanity. Perhaps, however, the most remarkable of all these native curiosities is the gigantic and very striking piece of wood-carving exhibited by Mr. Horwood, and obtained by him from the native who made it in Zululand. This strange object consists of three graduated central bowls of carved wood, stained black, and diminishing in size as they rise upward. All around them smaller bowls project, and each has its basin-like cap. The height of the whole structure, for it really deserves that name, is nearly five feet, and its diameter about three feet. It is entirely hewn and cut from one solid block of wood, and it took the maker, who had only a knife to work with, eighteen months to execute. Its use is to hold beer. Old African travellers say that they have never seen anything at all equal to this extraordinary production, and we may safely believe that it is the largest and most elaborate thing of its kind made in South Africa.

Having said so much about the purely native productions that have gone to Dublin, we proceed to the most valuable part of the collection, that which illustrates the industrial and commercial resources of the colony itself. Here, as we have said, allowance must be made for the hurried nature of the effort. The articles that are exhibited have been hastily got together, and they must by no means be taken as a pattern sample of what Natal can grow. In regard to sugar, which may be looked upon as our staple product, we have been

fortunate enough to secure a sample of the best sugar yet made in Natal by the ordinary process. It comes from the estate of Mr. H. Shiro, on the Umhlanga, and was made in his battery by Mr. Collard, a Mauritian sugar-boiler of great experience. In size and purity of grain it almost equals sugar made by the vacuum pan process, and it is not only a proof of the great suitability of our coastlands to the production of sugar, but it shows what can be done when science and skill are applied. Mr. A. Wilkinson's samples are also of the most excellent colour and quality, and are specially interesting as being old sugars, and so well cured that they will not change colour. The vacuum pan sugars from Canonbie estate are *au generis*. No other plantation yet possesses this important appliance. We are indebted to Mr. Lewis Reynolds for these excellent samples. Altogether the array of sugars will be enough to prove that Natal is equal, as a sugar producing country, to either the Mauritius or the West Indies. Mr. A. Wilkinson's bottles of rum, rectified spirits, and rum shrub will be a new feature never exhibited before. The spirit is manufactured from the refuse of cane crops, and is fit for chemical purposes or varnish. Mr. T. Reynolds' rum—known locally as "Umhlali Water"—comes from one of the oldest stills in the colony. Our planters have a considerable field of profit open to them in the matter of distillation.

Mr. Baker's samples of wool and angora hair are well prepared, and will reflect credit on that gentleman's well-known zeal in improving the character of our stock by his many importations of high-bred animals from first-rate European flocks. Had the season been more advanced, better samples could have been shown, but those sent are sufficient evidence of the quality of wool and hair that can be grown here. We hope that other samples of wool will be contributed by brokers at home. There are also fine samples clipped from the flocks of Mr. Mesham and Mr. Tomline. There are not far short of 200,000 sheep in the colony now.

The Cotton Company's bales of cotton are better samples than those shown in 1862. Mr. T. Reynolds sends a beautiful parcel of cotton from Oaklands. Mr. Martin's hank of wild cotton twist, from near Delagoa Bay, and the sheet made therefrom, may afford some speculation to those interested in the discovery of new fibres. The very fine samples of flax from Messrs. C. Hunter & Co.'s flax-works ought to attract some notice in Ireland, where this staple gives support to so many people. Mr. Benningfield's aloe and pineapple fibres show to what purpose two plants—one of which is met with wild, while the other grows like a weed—can be put. In Mexico the Indians and the half castes dress largely in fabrics made of the fibre of the agave. There are hosts of fibres little known to the scientific or industrial world, but very valuable withal, existing in a wild state in this colony and the interior. Dr. Mann's collection of woods is complete so far as it goes, though necessarily not so numerous as in 1862. Mr. Topham also sends some beautifully prepared woods, many of which take a fine polish.

No better flavoured tobacco can be desired than that of Mr. C. Manning. Rich, mild, and fragrant, it is just what a critical smoker would desire. Mr. Hodgskin's nicely prepared box of colonial cigars, containing four different sorts, could not be improved upon. All that the "weeds" require is age. Mr. Crozier's cigars made of tobacco raised from seed obtained at Latakia, are singularly genial and temperate. A year hence, we believe, they will be delightful. Cayenne pepper is abundantly represented by samples from Mr. P. Steel, Mr. J. P. Voysey, and Mr. Russell. All, however, differ in colour and quality. There need be no limit to the local production of this article—the pulverized capsule borne by the chili and capsicum bushes. Arrow-root is only represented by a sample from Mr. Stainbank, the last season's supply having been all shipped. The same cause has prevented us from procuring more

than one sample of coffee. That one, however, is worthy of especial notice, as it is first-rate, both in colour and quality. It comes from Mr. Crozier's beautiful estate at Clairmont, near Durban, and is from the first of what promises hereafter to be a very large crop. Mr. Stainbank's preparations of bones, and bone dust illustrate the good uses to which waste substances may be applied.

Corn is not so fully or fairly represented as we could wish. Messrs. Henderson and Scott's maize and wheat prove what can be done in that way, and Mr. Baker's oats are equally as significant, but of the one great item of maize—the staple cornstuff of the country—we have failed to get more than the one sample. The mealies shown in 1862 were pronounced equal to any in the Exhibition, and the colony can grow just as fine corn now as it could then. Nor have we been able to get, as we hoped to do, any barley, rye, or millet. Nor are our mineral resources represented, other than in the form of spear heads and other implements made by the natives. Mr. Topham has also sent a piece of copper, mined and smelted in the same way. But coals have not been overlooked, Mr. Baker having forwarded a box of superior specimens contributed by Mr. G. Whitelaw, Maritzburg. These will go to show that the coal company has something tangible to support its designation. We understand that our local smiths never hesitate in giving the preference to colonial over imported coal—the former burns so long, so brightly, and so well. Messrs. Henderson and Scott have sent some fine wheaten flour.

Nor must we overlook Mr. P. B. Short's contributions. Those luscious and tempting preserves of pineapple, bananas, amatungula will, we dare say, make many mouths water. The last named being a native fruit, will be new to most of those who look at it. The syrups made from the same fruit, and from the pineapples have golden and delicate pink tints that are very pleasant to the eye. The box of candied fruits will, we fear, suffer from the voyage, but the chutney is proof positive that we can produce here the famed preparations of India. There are only one or two other articles that we need name. The copies of Messrs. Davis and Son's Natal Almanacs are a creditable example of our literary and typographical capabilities, and the maps sent by Dr. Mann will assist the spectator to form an intelligent comprehension of the colony from which these various articles have come. Messrs. Brock have promised some of their excellent photographs, but we venture to think that Dr. Mann's photographs of Bishop Colenso's "Intelligent Zulu" and his wife will excite more interest than any other item on the list.

We have endeavoured to arrange with persons now in England to forward other contributions from thence. Mr. A. W. Evans will probably send a few magnificent tusks of ivory, from a lot lately received from the interior, and which we have never seen equalled for uniform largeness of size. Messrs. Henderson, Bergthiel, Baker, Topham, and others, have kindly promised to instruct their agents to forward specimens of either curiosities or produce to Dublin. These, together with what is sent from here, Mr. P. L. Simmonds, the able and enthusiastic Colonial Commissioner, will take charge of. One great want much felt in 1862 we have done our best to supply. We refer to the need of a small explanatory pamphlet, briefly describing the features, the position, and the general circumstances of the colony. Such a pamphlet we have had prepared, and a thousand copies we send as our contribution to Dublin, for gratuitous distribution amongst enquiring strangers. This will act as a sort of guide to the modest collection around.

Such, then, hastily reviewed, is the collection which is to represent us this year at the International gathering in Ireland. Now, as three years ago, we are alone in our glory, for our neighbours at the Cape have not thought fit to make any effort. We are, therefore, once more the sole representatives of South Africa.

THE NATAL COURT — DUBLIN EXHIBITION. 1865.





1 BAKER, W. G. *Pietermaritzburg*.—Small bale of wool in grease; Angora goat hair; bag of seed oats; 3 pairs of buck horns; box of coal.

2 BARRY, *Natal*.—Articles of the chase and native manufacture, collected by Mr. Barry, lately arrived at Natal from Walvisch Bay, on the West coast, the first Englishman who has traversed the continent at this point; most of this collection is from the neighbourhood of Lake N'gami, and is the production of Bechuana tribes. Rope, twine, fishing net, and fibres; tanning substance from the bark of a mimosa; large pot; war knife, the first of the kind that has ever been obtained; rude carving of an elephant, interesting as an illustration of Bechuana art; pair black buck horns; very large bullock horns from the lake N'gami; poisoned arrows; furs and feathers; caps and head-dresses; fans and rattles; paddles.

3 BENINGFIELD, S. *Durban*.—Aloe, pine apple, and other fibres grown and prepared by him.

Mr. M. J. M'Ken, of the Botanical Gardens, Durban, enumerates the following fibrous plants indigenous to, or cultivated in, Natal:—

INDIGENOUS.—*Hibiscus cannabinus*—from the fibre a kind of hemp is prepared. *H. furcatus*—the bark yields abundance of strong white flaxen fibres. *Parietium tiliaceum*—produces a valuable fibre, much used for ropes. It is little affected by moisture, and hence is chosen for measuring lines, &c. *Sida*—there are three species of this genus common in Natal, the bark of which yields abundance of delicate flaxy fibres. *Crotalaria capensis*—yields a strong and tolerably soft fibre, but much inferior to hemp. *Sansevieria* sp.—the leaves of this plant abound in fibre, remarkable for fineness and tenacity. *Gomphocarpus*—and others belonging to the milkwood family, yield a large quantity of fine silky fibre. In addition to the above there are many others which yield fibrous material, such as the *Oreia*, *Corchorus*, *Triumfetta*, *Urtica*, *Ficus*, *Hyphaene*, *Phoenix*, &c.

CULTIVATED FIBRE-YIELDING PLANTS.—*Agave Americana*: the fibres from the leaves of this plant closely resemble those of the Maguey, which are used in Mexico for the manufacture of coarse wrapping paper, and which Meyer describes as having almost the toughness and tenacity of iron. *Fourcroya gigantea* abounds in excellent fibre, suitable for ropes, lines, or paper. *Pandanus utilis*: vacoa, or screw pine; the common sugar bags used here and in the Mauritius are made from the leaves of this plant. The leaves are composed of tough longitudinal fibres, white and glossy, and make excellent cordage. *Bromelia pinguin* yields a strong fibre which is twisted into ropes and manufactured, in Central America, into cloth, of which the Spaniards make hammocks, &c. *Ananassa sativa*: the fibre of the leaves of the pineapple is extensively used in manufacturing the delicate fibre of the Indian Archipelago known as "Pina." *Yucca aloecifolia* abounds in fibre of fine quality, and strong in nature; it is known as silk grass. *Phormium tenax*: New Zealand flax. *Musa*: the stems and leaves of both the plantain and banana abound in fibre useful for textile or cordage purposes, while the tow which is separated in preparing the fibres forms an excellent paper material. *Corchorus capsularis*: jute is produced from the bark of this plant; and granary bags and a kind of a cloth called chetar are made from it. *Hibiscus esculentus* and *H. sabdariffa* abound in fibre of fine quality. *Bahmeria nives*: the reba plant of Eastern India, and furnishing the China grass cloth or linen. It is not unlike silk in appearance, and has a softness and strength distinct from that of the fabric of any other fibre. In respect of strength, it has been proved by numerous experiments that this fibre sustains a weight always much greater than the best Russian hemp. Besides the above plants cultivated there are numerous others producing fibres, among which may be mentioned flax, hemp, Jerusalem artichoke, oleander, baubinia, Parkinsonia, the common sunflower, mulberry, &c.

4 HUNTER & Co. *Natal Flax Works, near Maritzburg*.—Flax grown and manufactured by exhibitors.

5 GRANTHAM, Capt. A.—Map of Natal (minus the mountains), and two smaller maps; two paddles used by the natives for their canoes on Lake N'gami.

6 HENDERSON & SCOTT.—Small bag of Natal wheat and flour; maize.

7 MACLEAN, His Excellency Col.—*Amazosa* assegais; a bushman's spade.

8 MANNING, C.—Tobacco grown at Verulam, 18 miles north of Durban.

9 MARTIN, W.—A sample cut from a large hank of cotton twist, from wild cotton or fibre procured by natives near the Portuguese settlement of Delagoa Bay, in the Trans-Vaal Republic, and which they usually manufacture into cotton sheets.

10 ROBINSON, JOHN.—Messrs. Davis & Son's Natal Almanac, 1865, from the publishers; the Pietermaritzburg Agricultural Society's Report for 1864, containing valuable statistics, contributed by the society; photograph of "intelligent native;" 1,000 copies of descriptive pamphlet of the colony; locks of wool.

10a GIFFORD, Mr.—Large pair of gemsbok horns (the lion killer—*Oryx gazella*).

11 SCOTT, His Excellency, the late Governor, London.—Pair buck horns, very large (*Tragelaphus sylvaticus*); do. of roe rheo-buck, very small; of the water-buck (*Kobus ellipsiprymnus*); of gemsbok, or lion-killer (*Oryx gazella*); of Harris's buck; 2 pair of the hartebeest (*Accephalus Caama*); 2 pair of the bles-buck (*Damalis albifrons*); 4 pair of the blue-buck, or bastard eland (*Agoceros leucophaea*); pair of the koodoo-buck (*Strepsiceros kudu*); 3 pair of the blue wildebeest or gnu (*Gorgon Gnu*); horns of reet-buck (*Eleotragus arundinaceus*); of the fall rheo-buck, very small; horn of black rhinoceros (*Rhinoceros Africanus*).

12 SHORTT, P. B. near Durban.—9 bottles preserves; 3 of syrup; 3 large bottles of native fruit preserves; 1 box sweetmeats; 2 bottles chutney.

13 STEEL, P. near Durban.—Cayenne pepper.

14 STAINBANK, M. Coedmore, near Durban.—Five sorts of bone dust, ground by the exhibitor; one bottle of arrowroot ground and manufactured by do.

15 TOPHAM, BROTHERS, *Pietermaritzburg*.—17 specimens of colonial woods; 9 Kaffir spoons; 4 snuff-boxes; bead ornaments; Kaffir pillows; 3 Kaffir baskets; 3 lion skins; 2 silver jackal skins (*Vulpes caama*); 6 pair buck horns, viz., of the Moosuke; the inchucha or diker (*Cephalopus*), one of the smallest of the Natal antelopes; the bootumbu, 2 pair; the impuvu; the coomagu; 9 Kaffir sticks; war shield of a Zulu Kaffir; knobkerries (clubs) and assegais; strainers for native beer; stone pipe-head; copper, mined and smelted by natives; feather, cap, and cape of a chief; ostrich eggs; buffalo's horns; kaross of jackal skin; 5 elephant's tusks; pipe for smoking dacca or wild hemp; native grown tobacco.

16 VOYSEY, J. P. *Umgeni, near Durban*.—5 bottles Cayenne pepper, manufactured from Natal-grown chillies, by the exhibitor.

17 WILKINSON, A. *Great Umhlanga*.—Well-cured yellow and grey sugar; rum, 30 o.p., made from cane juice double distilled; rectified spirits from refuse of the cane crops, 57 o.p., fit for chemical purposes and varnish: rum shrub.

18 HALL, T. *Accountants' Department, General Post Office, Dublin*.—A very fine rhinoceros horn (*Rhinoceros Africanus*).

19 REYNOLDS, T. *Umhlati*.—Orleans or short staple cotton grown on Oaklands estate; 6 bottles of Umhlati water (rum).

20 COTTON PLANTATION COMPANY OF NATAL (LIMITED), 6 Great St. Helen's, London.—Cotton grown from American seed; cotton grown from Egyptian seed.

21 EVANS, A. W. *Durban*.—Three pairs ivory tusks (*Elephas Africanus*), weighing 2 cwt. and 8 lb., averaging 77½ lb. each.

**22 SAVORY, H. & W.** *Natal and London.*—Coffee, sugar, and arrowroot.

**23 WISSING, G. & REYNOLDS, L.**—Two samples of vacuum-pan sugar, made at Canonbie estate, Lower Umcomase.

**24 UMZINTO PLANTATION & TRADING CO. OF NATAL, London.**—Grasses; mealies, or Indian corn; Kaffir corn (*Sorghum*); sweet reed; sugar cane; tobacco, &c.

**25 HALL, WILLIAM EDWARD.**—Architectural and other drawings, namely—1. Ground plan of the design for Pietermaritzburg Collegiate Institution. 2. Plan with front, rear, and side elevations of the exterior and interior of Freemason's Hall, Durban. 3. Designs for the Town Hall at Pietermaritzburg—ground plan, front, rear, and side elevations. 4. Water-colour drawing of the Queen's Bridge, Lower Umgeni. 5. Drawing view of the Prison for the Umhlati district, county of Victoria, Natal. [The principal number of cases which engage the resident magistrates' attention are of Kaffir origin. Here is an attempt to depict the mode of the Kaffir debating a case before it goes into court, painted just previous to the Spring rains; at that time the whole country has a dry and hot appearance, with here and there large patches of land covered with the ashes of its grass-fire, after which the first appearance of living vegetation is the beautiful and much prized fire-lily.] 6. View of St. James' Church and the village of the Umhlati, county of Victoria, Natal. [The appearance of the country immediately after the first spring rains is of the most vivid green colour. This church and village is within 30 miles of Zululand; and in the district of the Umhlati there are also three American mission stations, and one Norwegian mission, all of which have lately been visited by W. E. Hall, as acting field cornet, and he vouches a totally different estimate of the moral and Christian progress of the colony of Natal from that which Archdeacon Grubbs has asserted.]

**26 HORWOOD, Mr. Durban.**—Two lion skins; matting; native wood carving; mats, and Kaffir curiosities.

**27 MANN, Dr.**—11 specimens of native wood, viz.:—Red milk wood; red assegai wood (a Cornel); black iron wood (South African ebony); brown stinkwood (*Oreodaphne bullata*), a laurel allied to the greenheart of Demerara; white stinkwood, sneezewood (*Pteroxylon utile*), allied to the horse chestnut; white pearwood, used for felloes; white assegai wood; yellow wood (*Podocarpus elongatus*), a yew; bastard yellow wood (*Podocarpus sp.*), rooi besje wood, sourberry; maps of the colony.

**28 SHIRES, H. Umhlanga.**—One packet of sugar, which in size and purity of grain almost equals sugar made by the vacuum-pan process.

**29 WALMSLEY, Mr.**—Map of Zululand.

**30 RUSSELL, Mr. Umgeni.**—One box cayenne pepper.

**31 HODGSKIN, Mr. Maritzburg.**—Box of cigars made from Natal tobacco.

**32 BRICKHILL, Mr.**—Six bottles of lotion, "Natal specific."

**33 M'KEN, M. J. Durban.**—List of dried plants from Natal botanic gardens:—1. Tamarind (*Tamarindus indica*); 2. Tea (*Thea viridis*); 3. Cinnamon (*Laurus cinnamomum*); 4. Arnotto (*Bixa orellana*); 5. Coffee (*Coffea arabica*); 6. Coffee; 7. Sandalwood (*Santalum album*); 8. Arrowroot (*Maranta arundinacea*); 9. Allspice (*Pimenta vulgaris*); 10. Bird-pepper (*Capsicum baccatum*).

## NEWFOUNDLAND.

With the exception of a few furs and minerals, the productions of the island of Newfoundland are exclusively confined to the fisheries. The annual average value of these amounts to £1,250,000. The number of sealskins (used for enamelled leather) often reaches half-a-million a year. The exports of the fisheries in 1863 were as follows:—

Dry codfish, . . .	811,777 cwts., value, £761,275
Cod oil, unrefined, . . .	2,696 tons, " £129,438
Do. refined, . . .	224 " " £23,000
Seal oil, . . .	4,145 " " £186,568
Seal skins, . . .	287,151 no. " £43,073
	<b>£1,233,353</b>

The only exhibitor from this colony was the firm of DE GRUCHY, RENOUF, CLEMENT & Co., who have a branch house at St. Heliers, Jersey. They exhibited preserved fresh salmon, in 6lb. and 1lb. tins, which only required to be opened near the rim and put in a saucepan of boiling water for ten or fifteen minutes. Preserved fresh lobster and preserved cod tongues in 1lb. tins. Preserved oysters in half pint and pint tins. These are put up in Jersey by A. M'E. Duncan, the others in Newfoundland, where 300,000 to 400,000 cases are annually preserved every season. The cods' tongues are a new description of preserve, and not yet known in commerce. They are generally served fried in butter, well browned, and require only ten minutes cooking. This firm justly received a medal from the jurors.

## NEW SOUTH WALES.

### North-west Gallery.

The colony of New South Wales has usually taken a very prominent part in the several International Exhibitions, but on the present occasion there was not time to obtain a grant from the colonial legislature, and to give prominent announcement in the colony. The Colonial Superintendent had to depend, therefore, entirely on friends in London interested in the colony for exhibits. A short abstract of the colonial statistics, as in the other cases, may not be out of place. The population in 1861 was 358,278 souls, being an increase of nearly 100,000 in ten years, notwithstanding the separation of Victoria, which drew away a large population and rapidly outstripped it by its gold fields. In the three years ending 1863, New South Wales exported about £2,000,000 in gold annually, and nearly 300,000 tons of coal yearly from its collieries. But it is for its pastoral wealth that it is chiefly famous, its wool exports having been steadily increasing. This will be the best place to touch upon the wool exports from our Australian colonies, to which our factories are mainly indebted for their raw material of clothing and combing wools. The following return shows the comparative export of wool in 1853 and 1863, from Australia and New Zealand:—

	1853 lb.	1863 lb.
New South Wales, . . .	16,477,869	21,204,597
Victoria, . . .	20,842,591	25,579,886
Queensland, . . .	not found.	10,669,044
South Australia, . . .	4,624,281*	16,568,979†
Tasmania, . . .	5,514,756	3,759,414
New Zealand, . . .	1,071,340	12,585,980
Western Australia, . . .	24,059	627,135
	<b>48,554,896</b>	<b>90,995,035</b>

**1 COOPER, Sir DANIEL, Bart.** 20 *Prince's gardens, London.*—Australian wines, silk, and fibres.

**2 FAUNTLEROY, R. & Co.** 99 and 100 *Bunhill row, Finsbury, London.*—Model of west front of Royal Exchange (London), constructed of more than 500 specimens of Australian, East and West Indian, and other colonial and foreign woods.

**3 HUGHES, HENRY P. & SONS,** 10, *Basinghall st. London.*—Fourteen choice samples of Australian and other colonial wools, namely, super scoured Port Philip combing and clothing wools; Hoggett fleece combing and clothing lambs; unwashed fleece combing

\* And 14,312 bales.

† And 48,226 bales.

wool; Queensland combing and clothing wool; unwashed New Zealand combing; unwashed South Australian combing; Van Diemen's Land fleece, and Cape of Good Hope fleece.

4 SIMES, J. T. & Co. 58 Coleman st. London.—Samples of Australian and other colonial wools, beautifully arranged and named—in cases.

5 GORRICK, I. Jun. West Maitland.—A stockman's whip.

## NEW ZEALAND.

### North-west Gallery.

1 CHURCH MISSIONARY SOCIETY, 12 Salisbury sq London.—Handsomely carved native box, done about 1820; fish hooks.

2 SIMMONDS, P. L. 8 Winchester st. London, S.W.—Fish hook; shell necklaces; Maori rug or cloak; New Zealand flax; photograph of New Zealand Exhibition (1865) Building, Dunedin.

## NOVA SCOTIA.

### North Gallery.

The Province of Nova Scotia, including the Island of Cape Breton, lies between N. lat.  $43^{\circ} 25'$  and  $47^{\circ} 10'$ , and between W. long.  $59^{\circ} 40'$  and  $66^{\circ} 25'$ . Halifax, the capital, is situated in lat.  $40^{\circ} 40'$ , which is nearly seven degrees farther South than that of London,  $51^{\circ} 30'$ , and not quite four degrees farther North than that of New York. The Province consists of the Peninsula of Nova Scotia proper, stretching out into the Atlantic Ocean, and the Island of Cape Breton. The length of the Peninsula is above 350 miles, and its greatest breadth 100 miles; it is connected with New Brunswick by an isthmus only twelve miles in width between tide waters, and divided from the Island of Cape Breton by the Strait of Cansuau (or Canso) sixteen miles long, and from half a mile to two miles in width, affording a safe and convenient passage for ships between the ocean and Gulf of St. Lawrence. Its area is nearly 18,700 square miles, or about 12,000,000 acres; of which Cape Breton forms about 2,000,000 acres.

Nova Scotia has a coast line of nearly 1,000 miles, indented by numerous bays and excellent harbours, of which Halifax is the principal on the Atlantic. Perhaps no country in the world is so favoured in number and excellence of harbours. It has numerous lakes and rivers; of the former there are about 400—the latter, owing to the comparatively small extent and peninsular form of the country, are small—few exceeding fifty miles in length—but they number scores. The Avon, Annapolis, St. Mary's and Shubenacadie, are amongst the largest. The surface of the country generally is undulating but not mountainous; the principal ranges are the Cobequid Mountains, and the South and North Mountains of Kings and Annapolis counties. The highest of these is in the Cobequid chain, which attains an elevation of 1,200 feet.

Nova Scotia is the nearest point of communication with Europe on the American Continent. It lies in the direct course of vessels sailing between Great Britain and New York; thus possessing peculiar commercial advantages, from which it must ultimately become the great highway of traffic between Europe and the North American Continent.

The scenery of Nova Scotia is diversified and picturesque, the surface presenting the alternate features of hill and vale; and in the less cultivated portions, with the variety of wood, and stream, and lake, presents attractive pictures of natural beauty.

In a geological and mineralogical point of view, Nova Scotia is one of the most important sections on the Atlantic coast of North America. It is rich in gold,

coal, iron ore, and other valuable minerals. The whole of the Atlantic coast has been termed "the Granitic Metamorphic District," consisting of altered rocks, such as clay and mica slates, quartz rocks and gneiss, associated with dikes and masses of granite. It is in this portion of the Province that the discoveries of gold have been made; either contained in the quartz veins imbedded in the slate, or in small particles in the sands which have been accumulated from the abrasion of the rocks by the action of the sea.

The climate, which is an important matter of consideration to intending emigrants, has been misrepresented as rigorous and disagreeable. It is true that Nova Scotia, like all countries on the Western coasts of the North Atlantic, is subject to greater extremes of heat and cold than countries in corresponding latitudes on the eastern coast of that ocean; but there are few subjects on which so much misconception exists as there does with reference to the climate of the North American Colonies. The comparatively great variety of temperature in Nova Scotia does not prevent the climate from being salubrious and agreeable; the nearness of every part of it to the sea causes a free and almost constant circulation of air through every part of it, rendering the atmosphere remarkably pure. Those violent intermittent fevers, so prevalent in other parts of America, are never generated; on the contrary, a person afflicted with disease of that kind, who may have undergone skilful medical treatment with no beneficial result, will, on removing to Nova Scotia, become quite well in a short time from the curative effects of the climate. The most important points in which the climate varies from that of Great Britain are its high Summer temperature, the shortness of the season (compensated for by rapidity of vegetation) and the lower temperature of Winter. The severity of the Winter is also compensated by the mildness and beauty of the autumn, which is frequently protracted to December.

The extreme of cold in late years is  $15^{\circ}$  Fahrenheit below zero; and the extreme of heat  $95^{\circ}$  above, in the shade; but the temperature seldom attains either of these extremes. The mean temperature of the year is  $43^{\circ}$ ; there are about 100 days in which the temperature is above  $70^{\circ}$  in Summer, and about 100 days in which it is above  $62^{\circ}$  in the remainder of the year; and about twenty nights in Winter in which it is below zero.

The coldest season is comprised in the three first months of the year; but the cold is not continuous, and the weather less uncomfortable than the humid atmosphere of Britain at this season, although changes of temperature are frequent and sudden.

The annual quantity of rain which falls is about 41 inches, of which nearly  $6\frac{1}{4}$  inches fall in the form of snow. There are about 114 days of rain, and 60 days of snow, on the average, in the year. An impression prevails among the inhabitants of the country that the Winters are becoming milder, attributable to the removal of the forest and the extending cultivation of the soil.

Spring commences about the end of March, or beginning of April; but during April the climate continues subject to sudden transitions of temperature, and is by no means so pleasant as in Britain at the same season. The Spring does not glide gradually from Winter to Summer, but rather consists of a series of changes alternating between the two. A prominent cause of these changes is the proximity of floating masses of ice from the Arctic and Gulf of St. Lawrence. The fogs also, although never extending any distance inland, sensibly influence the atmosphere. Agricultural operations commence in April, and the "seed time" continues throughout May and part of June. The next three months comprise the Summer, which is moderately warm; and vegetation is so rapid as to admit of the crops being harvested in August. Hay, for the Winter's fodder, is made in July.

From the beginning of July until the middle or end of September the nights exceed in splendour any that are experienced in Northern Europe.

The Autumn is unsurpassed for its healthful exhilarating atmosphere. The skies have the serenity of summer, and the air is sufficiently cool to be bracing and exhilarating to the human system. During October the weather is moderately warm at noon; the mornings and evenings cool, with sometimes, towards the end of the month, slight frosts at night, and now and then, but not frequently, a stormy day. The appearance of nature is gay until the middle or end of November, and the forests, tinted by night frosts with all the colours of the rainbow, present the gorgeous appearance for which American scenery is remarkable; and being stocked with a variety of game, are a paradise for the sportsman. Winter cannot be said to begin until the middle of December. January is remarkable for frequent thaws; February for the lowest depression of the atmosphere, and the heaviest falls of snow; March, though cold, variable, and blustering, frequently affords more days of clear sunshine than April. The Winters are, however, variable; sometimes moderate and open, and sometimes cold with less frequent changes.

If a similarity in the productions of the field and garden be taken as furnishing a criterion for the comparison of climates, that of Nova Scotia cannot differ essentially from the climate of the middle and Northern parts of Europe. Wheat, oats, rye, peas, beans, barley, Indian corn, turnips, potatoes, beet, mangel wurzel, and other roots, grow in abundance. Apples, pears, plums, cherries, and the smaller garden fruits, attain their utmost perfection. In many localities peaches, quinces, and grapes, ripen in the open air, and in any place will thrive luxuriously under glass without artificial heat.

Halifax is the principal seat of provincial commerce, but there are fifty-three more shipping ports, which contribute considerably to the aggregate amount; the principal of these are Pictou, Yarmouth, Liverpool, Windsor, Pugwash, and Sydney, Cape Breton. As the resources of the province become developed, the general commerce must increase to an almost illimitable extent.

The largest portion of the exports of Nova Scotia are, as yet, drawn from its fisheries and agricultural resources; the products of the mines and quarries are next in importance, and these are followed by furs, timber, and deals, manufactures, and miscellaneous articles. Ship-building has been carried on to a very great extent, and the value of vessels sold to Great Britain and other colonies must make an important addition to the amount of exports. But this branch of trade is fluctuating, and not to be depended upon for regular continuance. The principal exports to Great Britain consist of timber, deals, ships built in the province, furs, and fish oils.

The trade with the neighbouring British provinces is steadily increasing. There is a large growing trade with Canada in West India produce, the returns from Canada being in bread-stuffs. The increased intercourse amongst the colonies must tend to bind their interests more closely together, and create a cordial policy of a common bond of self-preservation and progress amongst the loyal millions who boast of their allegiance to the constitution and crown of Great Britain.

#### EXHIBITED BY THE GOVERNOR AND LEGISLATURE OF THE PROVINCE.

1 ARCHIBALD, Hon. T. D.—Coal, Gowrie Mines, Cape Breton. 2 ARCHIBALD, S. G.—Oakum.

3 BARBER, J.—Preserved fish.

In fish, the resources of Nova Scotia are most abundant, thronging her coasts, and swarming in every river and stream. Cod, haddock, halibut, mackerel, shad, alewives, and salmon, are found in her seas in inexhaustible quantity; while trout, salmon, perch, and other varieties of freshwater fish, supply her rivers and lakes. The halibut attains a prodigious size, sometimes weighing 500 pounds. The shad, a delicious fish, of delicate flavour, is taken in Cumberland Basin, Minas Basin,

and the estuaries of rivers which empty into them. The alewife, or gaspereau, is found in the rivers and streams in Spring, and is there caught in great quantities.

4 BEGG, Mrs.—Straw work, native product; home-made cloth. 5 BILL AND SKERRY.—Axes.

6 BLAIR, Mrs.—Socks.

7 BLANCHARD, CHARLES.—Cereals.

8 BROWN, R.—Coal, Sydney and Lingan Mines, Cape Breton. 9 BURROUGHS, P.—Glass printing.

10 CAMPBELL, C. J.—Coal, Campbellton Mines, Cape Breton. 11 CHAMBERS, —.—Portrait of Squaw.

12 CHESLEY, T. W.—Cereals.

13 CHISHOLM, A. M.—Mathematical mechanical scale. 14 CHISHOLM, D.—Set of harness.

15 COSTIN, P.—Cider.

16 COLEMAN, W. J. & SONS.—Complete collection of Nova Scotia furs.

17 COMMITTEE, NOVA SCOTIA EXHIBITION.—Cloth, useful minerals; coal; Maple sugar; honey; wax; herrings. 18 CREELMAN, —.—Wheat.

19 CREELMAN, S.—Cloth.

20 CROSKILL, J.—Cordials, syrups, &c.

21 DAY, FOSHAW.—Painting, Waverley Gold Field.

22 DODSON, —.—Cereals and garden seeds.

23 DOWNS, A.—Moose head, and four cases of native birds. 24 DOWNS, Misses.—Butterflies and moths.

25 DUPE, G. W.—Cordials, syrups, and cider.

26 FRASER, D. B.—Coal, Fraser Mines, Pictou.

27 GARSTON, T.—Cereals.

28 GOVERNMENT.—Gold nuggets.

29 GRANT, W.—Cloth.

30 HAMILTON, Dr.—Maize and wheat.

31 HARDING, C. E.—"Prisoner of Gisors," pen-and-ink drawing.

32 HENRY, Mrs. R.—Home made cloth.

33 HILL, Misses C. & S.—Home-made carpet; cone, bowl, and straw work.

34 HILL, Sherrieff.—Maple sugar and wood.

35 HOWEYMAN, Dr.—Geological collection; maps and sections. 36 HUTTON, J.—Garden seeds.

37 HOW, Dr.—Collection of minerals for scientific use.

38 JENNINGE, Miss.—Cone work.

39 JONES, T.—Hematite iron; bar and pig, Acadia mines. Iron mining has made but slow progress in Nova Scotia, although some of the works are situated where the ore is abundant and of good quality. Notwithstanding the extent of this most useful of metals, and the many natural advantages the country presents for iron works, the only one in active operation is the Acadian Company, in the township of Londonderry. Their operations consist in the manufacture of charcoal iron, of a superior quality, for the English and American markets; and the bulk of the ore is hematite. They have one blast furnace for smelting the ore, with three puddling furnaces, and one heating furnace for making bar iron. During the year 1863, they shipped 903 tons of bar iron and 402 tons of pig iron. The average number of men and boys employed during the whole year is about two hundred.

40 KAISER.—Black fox skin.

41 LANG, G.—Collection of building stones, marbles, and slates. 42 LEQUILLE MILLS.—Cloth.

43 LITTLETON, Capt.—Paintings: Halifax from York Redoubt, and Halifax from Dartmouth Lakes.

44 MACDONALD, Miss.—Scarf.

45 MACDONNELL, Lady.—Case of cutlery made of Acadia steel.

46 MACDONNELL, Sir R.—Cariboo skin and furs.

47 MACDOUGALL, Miss.—Painted fancy work and wax flowers. 48 MACKAY, J.—Garden seeds.

49 M'MILLAR, Miss.—Scarf.

50 M'NAB, J.—Cereals.

51 MOIR, T.—Biscuit, from Steam Bakery, Halifax.

52 MOYLE, H. M.—Flax, flax seed, and cereals.

53 MOTT, G.—Broma; chocolate and cocoa.

54 MURDOCH, W.—Cereals.

55 NASH, J. D.—Mass of manganese.

56 O'DONNELL.—Squaw—photograph.

57 PARISH.—Marquis and Marchioness of Normanby—photographs.

58 PRYOR, Dr. H.—Maize.

59 ROBINSON, A.—Galvanized topsail clew, with patent thimbles and jib hanks.

60 SCOTT, GEORGE.—Column of coal from Albion Mines, height 35 feet 6 inches, representing the thickness of the main seam. (*In the Garden*).

Coal is the most valuable mineral deposit in Nova Scotia; the most important measures yet explored are those of the Albion Mines. In one section the vertical thickness of the two large seams is 37½ feet and 22½ feet respectively. Valuable coal fields occur at Sydney and Lunenburg, in Cape Breton; and there is a mine in the Pictou coal measures where oil coal is found, affording upwards of 63 gallons of crude oil per ton.

The principal coal mining operations are still carried on by the General Mining Association at the Albion Mines, Pictou, at Sydney, Cape Breton, and at the Joggings in Cumberland County. The greater portion of the Pictou coal is exported to the United States. Between the beginning of 1858 and the end of 1862 seventeen new coal mines were opened by private companies, and many more are in progress of commencement. An unusual degree of interest, both at home and abroad, has now been awakened in the coal mines of Nova Scotia and Cape Breton, and the increased quantity of coals raised and exported, affords the best proof that the trade is being prosecuted with vigour and success. The year 1862 showed an increase of 70,000 tons in the export over 1861, and 1863 exceeds 1862 by 37,000 tons.

Hitherto the great bulk of coals has been shipped from the mines of Cape Breton, but recent explorations have discovered extensive coal fields in the county of Cumberland, which have already been partially worked; and preparations are now making to work them upon a larger scale. Throughout the Province, during 1863, there were no less than one hundred and fifteen applications for licenses to work newly discovered coal mines. The total quantity of coals raised, sold, and exported in 1863, amounted to 394,705 tons of large, and 34,846 tons of slack.

61 STARR, D. & SONS, Halifax.—Forbes' patent self-fastening skates.

62 SYMONDS, W. S. & Co.—Stoves of Acadia iron.

63 SYMONDS, KAY, & ROSE.—Coal from Schooner Pond, Cape Breton.

64 THOMPSON, J.—Corn (Sorghum) brooms and brushes.

65 TURNER, Miss.—Straw work—native product.

66 WATSON, Miss.—Micmacs.

67 WATT, J.—Tobacco.

68 WAVERLEY, GERMAN GOLD MINING CO.—Bar of gold, weight 48 lbs., and auriferous quartz.

In the year 1858, Mr. John Campbell, of Halifax, communicated to several gentlemen his conviction that Nova Scotia was a gold producing country from having observed the presence of the metal in the sands of the southern sea coast, during investigations carried on through many years. He, with some others, then made application to the government for gold mining leases in Sable Island, which lies about 80 miles from the South coast of the Province; the sands of this Island being impregnated with very fine gold dust, and gold in scales polished by the surf. Continuing his researches on the mainland, he ascertained that gold was dispersed through the boulder clay, or deposits of the *drift period*. Finding it diffused in these ancient materials, ground from the rocks, he put on record, before several witnesses, his opinion of Nova Scotia being a gold producing country; but the terms on which the government agreed to comply with the lease applied for, not being satisfactory to him and his friends, the project was abandoned.

The earliest discovery made known to the public occurred during the Summer of 1860. The discoverer, having heard something of gold-bearing quartz, was

induced to make a search; and with some Indians whom he hired, found several pieces of gold quartz in a brook. Numbers gathered to the spot, but, not finding gold in remunerative quantity, the place was abandoned before the close of the year. In October of the same year gold was found in a brook by a fisherman and landowner while stooping to drink; but as he was unwilling to allow people to prospect on his land, little was done towards discovery until April following, although gold had also been found at Wine Harbour in the preceding July. 1861 was the decisive year for discoveries, during which the precious metal was found in many different places, and the government took measures for laying off and leasing mining lots. Since then gold mining has been prosecuted with various success.

Until the year 1863 there was a tumultuous rush to the gold mines, as they were successively discovered, of men possessed of little or no capital, who took up most of the mining lots disposed of by the government, and a large number of them succeeded well. However, a large number failed, or soon saw that if they persisted in the attempt to carry on quartz mining without capital they must fail. Meantime capitalists became convinced that the gold mines were, on the whole, proving highly productive, and accordingly entered the field. A number of joint-stock gold mining companies were organized, and the mining operations in the gold districts are now settling down into a steady and profitable business. The gold procured during 1863 nearly doubled that of 1862, although a large proportion of the work was expended in making roads, erecting crushers, and other works preparatory to mining. There is no doubt that gold is extensively diffused over a large portion of the province, and the results of last year prove that the quartz of Nova Scotia is richer in gold than the quartz of Australia, where the profits arise from the large scale on which operations are carried on. When similar operations reach a proportionate scale in Nova Scotia, the profits must be much greater than in Australia. Few mining shafts yet exceed one hundred feet in depth; but the quartz seams are found to increase in richness as they descend, and some of them have proved exceedingly rich. There is now less popular excitement on the subject, but those engaged have increased confidence in their work, and from every one of the gold districts the accounts are favourable, the quarterly returns from the Gold Commissioner showing a regular increase in the return of gold per ton of quartz. The average yield, on the 31st of March, 1864, was 19 dwt. 13 gr. per ton, and the maximum yield 21 ounces per ton.

The total yield of the Nova Scotia gold fields for the year 1864 was 20,022 ozs. 13 dwts. 13 grs. against 14,001 ozs. 14 dwts. 17 grs. for 1863.

The total value of the gold obtained in Nova Scotia in the 3 years ending 1864 was £161,000. The yield of gold in Nova Scotia for the year ending 30th September, 1865, was 24,907 ozs., being an increase of 32 per cent. on that for 1864. The quantity of gold exported from New Zealand, from 1861 to the end of 1864, was 1,814,026 oz. troy, of the value of £6,250,000, of which the province of Auckland produced 10,000 ozs.; Nelson, 80,000; Marlborough, 30,000; Canterbury, 2,500, and Otago, 1,691,526. Total, 1,814,026 ozs., or 103 cubic feet of solid gold, which was represented at the New Zealand International Exhibition of 1865, held at Otago, by an obelisk of that size. The total yield of gold in Victoria, the largest gold-producing British colony, is stated in the description of the pyramid shown at Dublin.

69 WILLIS, J. K.—Case of Nova Scotia edible mollusca.

## QUEENSLAND.

North-west Gallery.

1 CRAVEN, J. 23 Leeds-road, Bradford, Yorkshire.—Colonial wools and yarns; merinoes, cashmeres d'Ecosse,

llama, and reys; cobourga, paramattas, and baratheas, made of Australian wools.

2 MORT, W. 155 *Fenchurch-st. London*.—Slab of malachite from the Peak Down Copper Mines.

3 SILVER, S. W. 2 *Bishopsgate st. London*.—Bunya-bunya, or large cone of *Araucaria Bidwelli*, seeds eaten by the aborigines.

4 SIMMONDS, P. L. 8 *Winchester st. S.W.*—Lerp and Australian manna; Dugong oil, a substitute for cod-liver oil; photograph of native.

5 EMERY, W. F. *London*.—Oil painting—View of a station in the Darling Downs.

6 JORDAN, H. *Government Emigration Office, 2 Old Broad st. London*.—Samples of cotton, wool, silk, and fibres; model of ship; four framed photographs of natives; two carved bed-posts of native wood.

## SIERRA LEONE.

### West Gallery.

1 O'CONNOR, MAJOR-GENERAL.—African products; a large and varied collection illustrating African manners and customs.

2 EVATT, H. Colonial Surveyor, *Freetown*.—Native woods; beads, belts, armbands, &c., of an African lady, from the Niger.

## SOUTH AUSTRALIA.

### North-west Gallery of Nave.

1 SIMMONDS, P. L. 8 *Winchester st. S.W. London*.—South Australian wheats and flour; 4 turned cups of Australian woods.

2 SOUTH AUSTRALIAN COMPANY, 4 *New Broad st. London*.—Case containing 10 specimens of olive oil and fruit; 25 specimens of woods; 8 specimens of copper ore, and 1 bag of regulus, from the Kaumantoo mine. 15 water-colour drawings of Adelaide and the mining districts, South Australia, taken in the early foundation of the colony, viz:—1. Kapunda Mine. 2. Burra Burra Mine. 3. North Terrace, Adelaide. 4. Hindley street, ditto. 5. Not named. 6. North Adelaide. 7. View in ditto. 8. View of South Australia Bank, Adelaide. 9. Street in Adelaide. 10. Rundle-st., looking from the East terrace to the corner of King William-street. 11. Ditto, looking towards East terrace and the Mount Lofty range of hills. 12. Government House. 13. View in North Adelaide. 14. Agricultural and Horticultural Show. 15. Glen Osmond Mine.

## TASMANIA.

The following despatch, from the Governor to the Secretary of State for the Colonies, explains the reason why no contributions were sent direct from this colony:—

Tasmania, 21st November, 1864.

SIR.—In reply to your circular letter, dated 19th July, 1864, I have the honour to forward a memorial by the Colonial Secretary, giving reasons why the colony will be unable to comply with the wishes of the Secretary of the Dublin Exhibition Palace.

I have &c.,

(Sig.), J. GORE BROWNE.

The Right Honourable

Edward Cardwell, M.P., &c.,  
Downing-street.

### MEMORANDUM.

The Colonial Secretary has the honour to return herewith the circular despatch of the Right Honourable

the Secretary of State, dated 19th July, 1864, transmitting copy of a letter from the Secretary to the Dublin Exhibition Palace Company.

The despatch, with its enclosures, has been communicated to the Council of the Royal Society, by whom it is stated that they are unable to take any steps to represent Tasmania on the occasion of this Exhibition, having no funds at their disposal for the purpose; and the Colonial Secretary is unable to recommend the appropriation of any public money to this object in the present state of the colony.

Independently, however, of any question respecting funds it would be scarcely possible to have suitable objects prepared, collected, sent home, and arranged by the time it is proposed to open the Exhibition.

(Sig.), JAMES WHYTE.

Colonial Secretary's Office,  
17th November, 1864.

### North-West Gallery.

1 SIMMONDS, P. L. 8 *Winchester st. S.W. London*.—Black fish oil, 3 kinds; porcupine oil; stringy bark (*Eucalyptus gigantea*); bark of tea tree (*Melaleuca*), recommended as a paper material; Dugong oil (*Manatus sp.*); aboriginal shell necklaces; vegetable caterpillars.

2 VERREKER, Hon. J. P. *Dublin*.—Various specimens of native Tasmanian woods; Walsh's Tasmanian Almanac for 1865.

[Dr. Crowther's phosphatic guano was shown in the Victoria collection. The sales of this guano, which did not exceed 462 tons in Tasmania and Victoria in 1863, in 1864 rose to 854 tons, and in 1865 was estimated at 1,600 tons—thus doubling themselves each year, and affording hope of a continuance of the like ratio of increase.

A large demand for this guano has sprung up in England. One of the great British guano houses is ready to take 10,000 tons, and another 20,000 tons per annum].

## TRINIDAD.

### North-west Gallery.

1 SIMMONDS, P. L. 8 *Winchester st. S.W. London*.—Brazil nut capsule (*Bertholletia excelsa*); nutmegs in shell; ditto fruit in spirit; down of (*Achroma Lagopus*); capsules of *Bixa orellana*; Guinea pepper, or grains of paradise; tonka bean in capsule; prize medal cocoa, 1862; wild, or forastero cocoa, 3 kinds; Bois de Rose; Cortiere wood; rope of *Sterculia caribbea*.

## VANCOUVER ISLAND.

### North-west Gallery.

1 ROBERTS, G. 4 *Fenchurch st. E.C. London*.—Specimens of wood of *Abies Douglasi* (Douglas fir); of *Cupressus* (red cedar,) and other woods shown in native manufactures and carvings; mat from bark of cypress; nettle hemp; dishes and pipes carved by natives in clay slate; 3 native carved and painted models of canoes; 3 horn ladles; 5 carved wooden combs; pouch made from roots of *Helonias tenax*, *Cyperus*, and *Thuja*; 2 carved rattles; 2 carved wooden figures; 2 wooden masks; 3 carved wooden bowls; 1 sheet of sketches of native tribes, by an Indian.

2 CHURCH MISSIONARY SOCIETY, 14 *Salisbury sq. London*.—Leather sledgu whip; Indian chief's leather ornamental coat; pair of snow shoes; calumet, or pipe of peace; model of birch bark canoe.

3 SIMMONDS, P. L. 8 *Winchester st. S.W. London*.—Oloochan oil, a fish oil recommended in place of cod liver oil.

## VICTORIA.

North-west Gallery.

Local Board appointed by the Government of Victoria to promote the objects of the Dublin Exhibition :—

Sir REDMOND BARRY, Chairman.  
The Hon. J. F. SULLIVAN.  
Dr. MUELLER, F.R.S.  
A. R. C. SELWYN, Esq.  
C. E. BRIGHT, Esq.  
W. W. WARDELL, Esq.  
R. BROUGH SMYTH, Esq.  
Professor M'Coy.  
J. G. KNIGHT, Esq. (Secretary.)

Representative of the Board in Dublin—TYNDALL BRIGHT, Esq.

Agent in charge of the collection—Mr. C. J. OVERY.

[The contributions exhibited on the present occasion are only to be regarded as a cabinet collection of types of some of the principal industries of the colony, it being considered that the space available for colonies and foreign countries would necessarily be rather limited. At the International Exhibition of 1862, the area occupied by the colony of Victoria was 5,665 feet. There were 542 exhibitors of objects, valued at £120,000. 111 medals and 92 "hon. mentions" were awarded; by far the greatest amount of commendation given to any colony of the empire.]

*Statistical Summary of the Progress of the Colony of Victoria to the year 1865, compiled from Official Records.*

By W. H. ARCHER, Registrar-General for the Dublin International Exhibition of 1865.

The colony of Victoria is situated at the most southern part of the great Australian continent. It lies between the 34th and 39th parallels of south latitude, and the 141st and 150th meridians of east longitude.

The area of Victoria is 86,831 square miles. The island of Great Britain contains 89,644 square miles, and is thus slightly larger than Victoria.

From its position Victoria enjoys a cooler climate than any other colony upon the same continent. Except during the prevalence of hot north winds, which occur at intervals during the Summer, the weather is never oppressive. The Winter season is mild, and the thermometer but rarely falls below the freezing point.

A fair average of the principal meteorological results throughout the colony may be gathered from the following figures, which show the mean temperature, mean atmospheric pressure, and amount of rainfall for the year 1863, in two seaport and two inland towns.

Name of Town	Height above sea level	Mean Temp.	Mean height of barometer	Days on which rain fell	Rainfall
	feet	°	inches		inches
Melbourne—seaport	91.3	57.5	29.896	172	86.428
Portland	37.0	61.7	29.949	178	45.310
Ballaarat inland ..	1439.0	52.9	29.479	178	37.270
Sandhurst .. ..	778.5	57.8	29.163	159	33.920

The last census of Victoria was taken on the 7th of April, 1861, when the population was found to amount to 540,322 souls; viz., 328,651 males, and 211,671 females. An estimate based upon this return and upon the records of births, deaths, arrivals, and departures since that period, shows the population at the end of 1864 to have numbered 604,858. Taking the population at the date of the census, and the area of the colony already given, the proportion was about six persons to the square mile. By the estimate of population on the 31st December, 1864, the proportion was nearly seven to the square mile. According to returns of the last census of the United Kingdom, taken simultaneously with that of Victoria, there were 344 persons to the square mile in England and Wales, and 177 persons in Ireland.

At the time the census was taken, the proportion of females to males in Victoria was as 64 to 100. The estimate brought down to the end of 1864 shows a proportion of 74 females to 100 males.

The number of inhabited dwellings in Victoria at the time of the census was 128,617, in which 535,043 persons were housed, this being the total land population of the colony, exclusive of persons actually travelling. This shows a proportion of about four persons to a house, or, more correctly, of 42 persons to ten houses. If the houses, since the census, have increased in the same ratio as the population, there would now be not less than 144,000 houses in the colony.

The principal town in Victoria is Melbourne, which is also the most populous city in all Australia. At the time of the census it contained, with its immediate suburbs, 126,536 souls. At the same period, Geelong contained 22,986 inhabitants; Ballaarat, 22,104; Sandhurst, 13,020; Castlemaine, 9,683; and Creswick, 4,714. Of other municipalities, two contained populations ranging between 3,000 and 4,000; seven between 2,000 and 3,000; ten between 1,000 and 2,000; and two between 500 and 1,000.

The total number of municipalities which had been formed at the time of the census was 44, containing a population of 235,301, or 43½ per cent. of the inhabitants of the colony. According to a return brought down to the end of 1863, the number of municipalities (or "boroughs," as they are termed by a recent Act) then formed amounted to 58, containing an aggregate of 276,815 inhabitants.

Besides self government by borough councils, another form of local self-government exists in Victoria—that by district road boards and shire councils. At the time of the census 63 road districts had been proclaimed, containing 199,298 persons. At the end of 1863, 98 road districts and shires were in existence, having 216,753 inhabitants. The population of shires and road districts, added to that of municipal boroughs, amounts to at least six-sevenths of the total population of the colony.

The number of Chinese located in the colony at the time of the last census, was 24,732; of this large number, only eight were females. The aboriginal inhabitants returned amounted to no more than 1,694, of which 648 were females.

The occupations of the people of Victoria at the time of the census were divided for the purposes of compilation, into 15 classes, which were again sub-divided into 67 sub-classes. Their nature will, however, be better understood, if condensed under the following ten heads:—1. *Persons engaged in Commerce, Trade, and Manufactures*, numbering 86,746; 2. *Gold Miners*, numbering 83,116; 3. *Persons following Agricultural and Pastoral Pursuits*, numbering 54,923; 4. *Labourers* (branch of labour undefined), numbering 8,122; 5. *Domestic Servants*, numbering 23,695; 6. *Persons engaged in Learned Professions, Fine Arts, and Literature*, numbering 7,376; 7. *Persons maintained out of the Public Revenue*, numbering 8,333; 8. *Persons engaged in Miscellaneous Pursuits*, numbering 1,056; 9. *Persons of Independent Means*, numbering 1,363; 10. *Residue of the Population* (consisting chiefly of women engaged in domestic duties, and of children being educated) numbering 265,592.

A careful estimate of the gold miners on the gold-fields has been brought down to the end of 1864, by which it appears that they numbered at that period about 85,000. The miners actually on the gold-fields when the census was taken amounted to 79,000, so that they have increased by 6,000 since then. To what extent the other branches of industry have been augmented during the interval which has elapsed since March, 1861, will not be known until another census has been taken.

The returns of nationality compiled from the census schedules show 157,911 of the inhabitants of Victoria to have been Australian born, 169,586 to have been English, 6,055 to have been Welsh, 60,701 to have been

Scotch, 87,160 to have been Irish, 8,030 to have been born in other British dominions, 46,330 to have belonged to foreign countries, and 4,541 to have been of unknown nationality. These results give 9,059 out of every 10,000 inhabitants in the colony as British subjects, 857 as foreign subjects, and 84 as unspecified.

By the census returns of religions, 301,113 of the inhabitants of the colony were Protestants (embracing 212,068 members of the Church of England, 87,103 members of the Church of Scotland, 46,511 Wesleyan Methodists, and 35,431 of other denominations); 109,829 were Roman Catholics, 2,903 were Jews, and there was a residue of 46,477, embracing Pagans, Mahomedans, persons of no religion, unspecified, &c. In every 10,000 of the population, there were thus 7,053 Protestants, 2,032 Roman Catholics, 54 Jews, and 861 of other sects.

As regards age, it is found that Victoria, possesses in proportion to her population, a larger number of persons in the prime of life and fewer of the old and very young than either of the other Australian colonies; thus, while at the time of the last census New South Wales had between the ages of 15 and 65 only 6,072 out of every 10,000 of her inhabitants, and South Australia no more than 5,547, Victoria had as many as 6,447 out of every 10,000. As compared with the mother country, the results of age are also to a marked extent in favour of Victoria, for, while Great Britain has only 477 persons in 1,000 between 20 and 60 years of age, Victoria has 574 in every 1,000.

The census returns of conjugal condition show that of every 1,000 males in the colony, 298 are husbands; of every 1,000 females, 402 are wives; also that of males of 20 and upwards, 458, and of females of 20 and upwards, 784 in every 1,000 are married.

The returns of education show that nearly four-fifths of the population over five years of age are able to read and write; that ten-elevenths are able to read, and that about one-eleventh is uninstructed; also that, of children at the school age, or between five and fifteen, 760 in 1,000 can read, and 486 in 1,000 can read and write. These results are more favourable than those shown by the education returns of any other Australian colony.

The births in 1864 numbered 25,322, the deaths 9,202, and the marriages 4,529. The births and marriages show larger numbers than in the previous year; notwithstanding the population has been increasing, the deaths have been gradually diminished in numbers during each year since 1860.

The arrivals in Victoria during 1864 numbered 36,156, and the departures 21,779. The increase of population by excess of the former over the latter amounted, therefore, in that year to 14,377. This is a larger increase from without than has taken place in any year since 1858. Since the year 1836, 796,515 persons have come to the colony by sea, and 396,206 have left it by the same means. The difference between which numbers shows a balance of 400,309 in favour of immigration.

The Crown lands sold and granted in Victoria from its first settlement to the end of 1864 amounted to 5,908,212 acres, and the amount of purchase money realized by the government was £11,690,191. The extent of land remaining unalienated at the same date was 49,734,251 acres; of this quantity, 30,463,999 acres was held under lease for pastoral purposes only, by 1,177 occupiers, giving an average of about 25,000 acres to each occupier.

The alienated land is nearly all in occupation. By the last return (31st March, 1864) 17,679 holders were in possession of lots of over an acre in extent, the average to each being 314 acres. The same return showed that nearly three-fourths of the alienated land was enclosed, but that only an eleventh was under cultivation.

The total extent cultivated was 507,798 acres, or less than an acre to every head of the population. About 149,000 acres were under wheat, 152,000 acres under oats, 8,000 acres under barley, 28,000 acres under

potatoes, 96,000 acres under hay, 35,000 acres under green forage, and the remainder under minor crops. Owing to atmospheric influences the last harvest was to a great extent a failure, but during the last ten years the average produce to the acre of wheat has been 20 bushels; of oats, 27 bushels; of barley, 23 bushels; of potatoes, 2½ tons; and of hay 1½ tons. The minor crops consist of maize, rye, and bere, peas, beans, and millet, turnips, mangel-wurzel, beet, carrots, and parsnips, onions, tobacco, and vines. For the two latter, the soil and climate of Victoria appear to be well suited, although their cultivation has only recently begun to be much attended to. Tobacco during the last season covered 623 acres and produced 5,913 cwt.; vines covered 3,076 acres, the produce of which was 121,000 gallons of wine, besides a large quantity of grapes otherwise disposed of.

The *live stock* in the colony, according to the returns for 1864, amounted to 117,182 horses, 126,786 milch cows, 548,496 other horned cattle, 8,406,234 sheep, and 113,530 pigs. All these descriptions of stock show an increase in the numbers returned in the previous year.

With regard to manufacturing industry, there were in Victoria, during 1864, 110 flour mills, which operated upon 3,280,000 bushels of wheat during the year, and produced nearly 70,000 tons of flour. There were 74 breweries, employing 495 persons, in which upwards of 4,000,000 gallons of beer were brewed during the year; and there were 646 manufactories and works of different descriptions, 204 of which carried on their operations by steam, 15 by water power, 4 by wind, 72 by horse, and 351 by manual labour. The total amount of power they employed was equal to that of 2,823 horses, and the number of hands engaged was between 6,000 and 7,000.

The total number of steam engines employed for gold mining purposes at the end of 1864 was 883, of which 441 were used in alluvial, and 447 in the quartz mining. The approximate value of all mining plant upon the gold fields was £1,496,699. At the same time it was ascertained that an extent of 799 square miles of alluvial ground throughout the colony had been actually worked upon since the opening of the gold fields.

The number of post offices in Victoria at the end of 1864 was 475, through which 7,034,467 letters and 5,226,485 newspapers passed during the year. The postal revenue in the same year was £126,451, and the expenditure was £127,000, irrespective of the cost of postal communication with Great Britain.

The *electric telegraphs* in Victoria are in the hands of the government. The telegraph stations in the colony at the end of 1864 numbered 73, between which were 2,326½ miles of lines, provided with 2,626½ miles of wire; the number of messages transmitted during the year was 256,380, of which 71,939 were on behalf of the government, and 184,441 were for private individuals. The government messages, of course, travel free; but if their value be calculated at the same rate as that of private messages, it would amount to £14,376, and, with £29,122 actually received from the public, would make a total revenue of £43,497 against £35,976 expended on maintenance during the year.

The returns of *railways* have not been brought down later than the end of 1863. The government lines extending from Melbourne to Sandhurst, and from Melbourne to Geelong and Ballaarat, were then 196 miles in length, but have since been opened to Echuca, making an aggregate of 250 miles.\* The total cost of the first portion of these lines was £7,452,000, or an average of £38,070 a mile. The private lines are all in the vicinity of the metropolis, and are the Melbourne and Hobson's Bay, 6½ miles in length; the Melbourne and Brighton, 6½ miles in length; and the Melbourne, 5½ miles long. The cost of these private lines amounted to £1,121,549,

\* Since this was penned a return of the total length and cost of the government lines, including the Echuca branch, has been furnished, showing the former to be 251 miles, and the latter to have been £8,750,570, or an average of about £35,000 a mile.

or rather more than £60,000 a mile. The number of passengers carried on all the lines during the year 1863 was 3,063,652; the weight of goods 440,000 tons, and the total receipts £579,923.

The total value of imports in the year 1864, approximately made up in the Customs, was £14,409,028, that of exports was £13,850,895. These numbers are slightly in excess of those for the previous year. The value of imports, however, in each of the years from 1853 to 1860 inclusive, except 1855, and the value of exports in each of the years from 1856 to 1859 inclusive, exceeded those in the year 1864.

The gold exported in 1864 was 1,545,449 ozs., valued at £6,206,237. The quantity was slightly less than that in 1863. Since the gold discoveries 30,716,200 ozs. of Victorian gold have passed through the Customs; which, with an estimate for the gold which has been taken from the colony by private hand, and for that remaining in the possession of individuals, banks, &c., at the end of 1864, would bring the total produce of the Victorian gold fields, from the first discovery of gold down to the 31st December, 1864, to 33,465,427 ozs., the value of which, at a uniform rate of £4 an ounce, is £133,861,708.

The wool\* exported in 1864 has been approximately returned by the Customs as amounting to 39,407,728 lbs., valued at £3,247,128. The total quantity of wool exported from the first settlement of the colony to the 31st December, 1864, was 404,960,872 lbs., valued at £28,548,543.

The quantity of tallow exported in 1864 was 3,881,920 lbs., the Customs value of which was £60,230. Since the first settlement of Victoria, 66,595,508 lbs. of tallow have been exported, of which the Customs value was £977,380.

The hides and skins exported in 1864 were valued at £102,684. Hides and skins to the value of £1,251,304 have been exported since the first settlement of Victoria.

The shipping inwards in 1864 amounted to 1,816 vessels, with an aggregate of 620,200 tons. Vessels to the number of 1,895, with a total tonnage of 641,510, were cleared outwards during the same year. The number of persons inwards and outwards in 1864 is in excess of those in the previous year, as is also the tonnage outwards. The tonnage inwards is, however, slightly less than it was in 1863.

There were nine joint stock banks in Victoria in the year 1864, besides three branches of Indian banks, which commenced business in Melbourne in that year. From the sworn returns of the nine regular banks the following particulars are gained. The aggregate amount of their paid up capital at the end of 1864 was £7,618,960, upon which the last dividend paid to shareholders was at the rate of 11½ per cent; the amount of reserved profits at the time of declaring that dividend was £1,594,506. The note circulation of these banks at the same date amounted to £1,306,809, and their total liabilities to £9,435,163, against assets at the same date amounting to £13,433,410.

The savings banks in Victoria are under the general control of commissioners appointed by government, under the provisions of the Act 16 Vic., No. 37. According to the last report of the commissioners, there were, on the 30th June, 1864, eleven savings banks in Victoria, in which there were deposits amounting in the aggregate to £769,681, belonging to 17,201 depositors. The amount deposited during the twelve months ending the 30th June, 1864, was £480,333, and the amount withdrawn was £438,556. At the end of 1864 the depositors were found to have increased to 17,460, of which 11,028 were males and 6,432 were females.

\* The quantity of wool here given exceeds by more than a third that exported from Victoria in the previous or any other year. The estimate has therefore been referred back to the Customs, in order to ascertain whether some mistake has not been made in forming the approximation; but up to the time of going to press the Customs authorities have not authorized any change to be made in the figures. In 1863 the exports of wool were as follow:—Quantity, 25,672,886 lbs.; value, £2,049,491.

There are also penny savings banks in many of the principal towns, in which deposits are received from a minimum of 1d. to a maximum of £1. These are managed by local Committees, and are not under governmental supervision. It is understood that the government have it in contemplation to establish post office savings banks in different parts of the colony.

Returns relating to the year 1863 were received in 1864 from 155 lodges or courts belonging to friendly societies. Eighty-six of these lodges or courts were of the Independent Order of Odd Fellows, Manchester Unity, and 67 were of the Ancient Order of Foresters. The number of members in these lodges or courts at the beginning of 1863 was 11,614, and the number at the end of the year was 13,568. The number of cases of sickness during the year was 1,503, the number of days for which alimony was allowed was 52,190, and the number of deaths was 97. The total revenue of these societies for the year 1863 was £45,605, and the total expenditure was £31,935. The assets, at date of balancing, amounted to £83,104, against liabilities, at the same date, only amounting to £400. It is understood that many courts belonging to these and other friendly societies omitted to furnish returns, so that the above is not a full statement of the affairs of all the friendly societies in the colony of Victoria.

During the year 1863, sums amounting in the aggregate to £1,665,331 were lent on mortgage of land in Victoria to 2,136 individuals, and sums to the amount of £674,550 were paid off by 1,134 persons. During the same year 272 mortgages on live stock were effected, and 120 were released; the sums secured on live stock amounting to £1,215,007, and the sums paid off to £773,516. The liens on wool during the year numbered 186, and the releases of liens 5. The amount secured on wool was £495,623, and the amount released was £23,029.

The total revenue of Victoria during the year 1863 was £2,979,682, and the total expenditure was £2,899,682. The exact revenue and expenditure of 1864 are not yet known, as receipts and disbursements on account of that year will not take place until the end of 1865. The probable amounts, have, however, been estimated by the Hon. the Treasurer, and are as follow:—Probable revenue, 1864, £2,993,082; probable expenditure, 1864, £3,011,054. These figures will, no doubt, be found to approximate closely to the correct ones.

The public debt of Victoria, at the end of 1864, amounted to £8,443,970, of which £443,000 was contracted to obtain funds for the construction of works to supply the city of Melbourne, its suburbs, and the town of Geelong with water; £67,800 to purchase the rights and privileges of the Melbourne, Mount Alexander, and Murray River Railway Company; and £7,933,170 to construct the Victorian railways. Besides this there were corporation bonds due by the towns of Melbourne and Geelong to the amount of £385,000, which, added to the amount of debt stated above, would make a grand total of £8,528,970 due by the colony at the end of 1864.

The buildings used for public worship throughout Victoria in 1863 numbered 1,352, of which 705 were regular churches and chapels, 278 were schoolhouses, and 369 were dwellings or other edifices. The approximate number of services performed throughout the year was 110,740, the number of persons for whom accommodation was provided was 190,330, and the number usually attending was 129,510. Of the whole number of buildings used for religious services, 298 belonged to the Church of England, 191 to the Roman Catholics, 297 to the Presbyterians, 427 to the Wesleyans, 134 to other Christians, and 5 to the Jewish body.

The clergy of all denominations at the same period numbered 431, of which 109 were attached to the Church of England, 49 to the Roman Catholic Church, 101 to the Presbyterian Church, 71 to the Wesleyan Church, 96 to other Christian Churches, and 5 to the

**Jewish Church.** Besides these, who (except the Jews exempted) are regularly licensed under the Marriage Act, there are in Victoria other officials attached to some of the sects, who, without being regularly ordained, perform the functions of clergymen, and are styled lay readers, local preachers, mission agents, &c. The number of these is not known, but if it could be ascertained, it would, no doubt, be found materially to swell the ranks of religious instructors in the colony.

The *Melbourne University* has been established since 1856, and attached to it are schools of law, medicine, and civil engineering. In 1864 the number of students was as follows:—Matriculated, 84; non-matriculated, 39; total, 123. The number of graduates were, direct, 12; *ad eundem*, 14; total, 26. The total receipts during the same year were £11,232, of which £9,000 was derived from government aid, £1,165 from College fees, and £1,067 from other sources; and the expenditure was £12,652. Attached to the University is the National Museum, which contains an interesting collection of objects of natural history, and of mining models, &c. The museum was visited in 1864 by 39,641 persons. No charge is made for admission.

The number of day schools returned throughout Victoria in 1863 was 1,019, of which 643 received aid from the revenue, and 371 were altogether unconnected with the State. The number of teachers or instructors was 2,063, of whom 946 were males, and 1,117 were females. The average number of scholars attending was 69,619, consisting of 37,187 boys, and 32,432 girls.

Most of the Christian denominations have Sunday schools. Returns were received in 1863 of 752 in different parts of the colony; of these, 145 were in connexion with the Church of England, 113 with the Roman Catholics, 107 with the Presbyterians, 305 with Wesleyans, and 82 with other denominations. The male Sunday school teachers numbered in all 2,686, and the female 2,616, or in all 5,302. The average number of scholars attending Sunday Schools was 47,085, of which 19,713 were males, and 27,372 were females.

The Melbourne Public Library is open to all classes of persons over 14 years of age, without payment or restriction. During the year 1864 it was visited by 179,787 persons, and since it was first opened in 1856, it has received about a million and a quarter visits. The number of books in the library amounts at present to 35,252, and sums varying from £5,000 to £2,000 have been each year voted for additional purchases. The total amount expended since 1853 has been £31,285. Under the same roof is the National Museum of Art, which was opened on the 24th May, 1861, and since then has been visited by 200,000 persons. The number of visitors in 1864 was 53,276. The total cost of the building, which is still unfinished, was, up to the end of 1864, £50,995. Besides the Melbourne Public Library, there is also a library containing 9,000 volumes attached to the Melbourne Mechanics' Institute, and there are libraries and mechanics' institutes in most of the principal towns. There are 23 of these institutions which furnished returns to the Registrar-General in 1863, and it is known that there are others which omitted to give returns. Some of these institutions receive books on loan from the Melbourne Library. The number of books in all the libraries was about 66,000 in 1863, and the total number of visitors was 326,735.

*Charitable institutions* in Victoria are supported partly by the State, and partly by the efforts of private individuals. There were at the end of 1863, 22 hospitals in the colony, which made up 1,123 beds in 118 wards. The number of patients during 1863 were, indoor, 7,529, outdoor 29,035. Their total receipts in the year amounted to £83,010, of which £18,230 were from private contributions. The expenditure of hospitals during the year was £73,014. Of benevolent asylums, there were eight in the colony at the end of 1863, including the Melbourne Immigrants' Home. These institutions then made up in the aggregate 1,366 beds, and 7,440 persons received indoor relief from them in

the year. Their total receipts in 1863 were £46,703, of which £8,064 was due to private effort. Their expenditure amounted to £46,519 in the year 1863.

There are two Protestant and two Roman Catholic Orphan Asylums in Victoria, situated in the towns of Melbourne and Geelong. These institutions contain accommodation for 505 children, and 580 passed through them in 1863. In that year their receipts were, from Government £9,933, from private sources £3,673, total £13,611. Their expenditure in 1863 amounted to £13,361.

The Government Lunatic Asylum at the Yarra Bend makes up 858 beds, and 1,030 patients passed through it in 1863. The receipts in the year amounted to £31,198, and the expenditure to £30,497.

The rates of wages in Victoria, although lower than they were during the period immediately succeeding the gold discoveries, are still high as compared with those ruling in older countries. Farm labourers, with board and lodging, now receive from 12s. to 18s. weekly, and good ploughmen from 15s. to £1. Shepherds, with rations and a hut to live in, receive from £30 to £40 annually; stock keepers from £40 to £70; hut keepers about £5 a year less than shepherds; generally useful men on stations, from 14s. to 18s. weekly, and shearers from 13s. to 14s. for every hundred sheep sheared. The working day of artisans and day labourers in Victoria is only eight hours, for which masons, bricklayers, and blacksmiths receive from 8s. to 10s. in Melbourne, carpenters from 7s. to 9s. In country districts, however, these wages run higher, and in some places are quoted at 12s. all round. General labourers, without rations, receive from 5s. to 7s. per day. Married couples, without families, obtain ready employment at from £40 to £60 a year; with families it is not so easy for them to find occupation in hired service, unless their children are old enough to be useful. Female servants usually experience but little difficulty in obtaining situations—housekeepers, cooks, and laundresses at from £30 to £40 annually; housemaids at from £20 to £25; nursemaids at from £12 to £20, and generally useful servants at from £18 to £30.

The cost of living in Victoria has been much reduced of late years, and the retail prices of the necessities of life will be found in many instances to be below the rates obtained in Great Britain and Ireland. Beef and mutton, of excellent quality, are sold in most parts of the colony at from 3d. to 5d. per lb.; tea, at from 2s. 6d. to 3s.; coffee, at 1s. 6d.; and sugar, at from 4d. to 6d. Owing to the defective harvest already alluded to, the price of flour, and consequently that of bread, was unusually high in 1864. The former, which for three previous years averaged from £12 to £15 per ton, in 1864 ranged from £20 to £28, and the latter, whose common price had been from 6d. to 9d. the 4lb. loaf, ranged from 9d. to 1s. Potatoes are commonly sold at rates varying from 1d. to 1d. per lb., and from 4s. to 8s. per cwt. Fruits and vegetables are plentiful, and during the proper season are sold at reasonable prices.

The rent of a cottage in Melbourne, suitable for a labouring man, ranges from 3s. to 10s. per week. There exists, however, a great desire amongst all ranks of Victoria, and particularly amongst the labouring population, to possess dwellings of their own. To aid in this object, building, and other mutually co-operative societies have been established in most parts of the colony, and through their intervention, numbers, by making small monthly payments, are enabled in a few years to become freeholders at little more cost to themselves than if they had been paying rent throughout the period.

The birth rate in Victoria during 1864 was 43 to every thousand of the living mean population (538,881), the death rate was 15·63 per thousand, and the marriage rate 7·69 per thousand. In England, during a series of years, the average birth, death, and marriage rates were respectively 34·06, 22·29, and 8·26 per thousand. The birth and death rates in the colony are thus found to compare favourably with those of England, the one

being higher and the other lower here than there; but a less favourable result is shown by the marriage rate, which is not so high in Victoria as it is in England. The birth rate in Victoria has remained nearly stationary for some years past; the death rate has declined, and in 1864 was lower than it had been in any year since 1856. The marriage rate has not changed during the past two years, but down to 1863 its decline had been rapid and continuous since 1854, in which year the proportion of marriages was as high as 14·08 to every thousand persons living.

**1 TENNANT, J.** 149 *Strand, London*.—Gilt model of the "Welcome Nugget," the largest gold nugget discovered. This nugget was found, on the 11th June, 1858, by a party of 24, at Bakery Hill, Ballaarat, at a depth of 180 feet, apparently water-worn, and of no regular shape, its length being 20 inches, breadth, 12 inches, depth, 7 inches, containing about 10 lbs. of quartz, clay, and oxide of iron. Previous to finding this great nugget the same party met with some smaller ones weighing from 12 to 45 ozs. It was first sold in Ballaarat, in 1858, for £10,500. After being exhibited for many weeks in Melbourne, it was sold there, on the 18th March, 1859; it then weighed 219 ozs., and fetched £9,325, or £4 4s. 11d. per oz.; melted in London, November, 1859, gross weight, troy, 2,217 ozs. 16 dwts. Assay gold per cent. 99·20 carats, gra. 23·34.

The next largest nugget discovered, the "Blanche Barkly," was found about a year previous (27th August, 1857), by a party of four, quite by itself, at Kingower, Victoria, at a depth of 13 feet, and within 5 or 6 feet of holes dug three years before. It measured 28 inches in length, and 10 inches in its widest part, and apparently contained 2 lbs. of quartz, clay, and oxide of iron; melted in London, 4th August, 1858. Value, £6,905 12s. 9d. This nugget, previous to melting, was exhibited in Melbourne, and at the Crystal Palace, Sydenham, where it was an object of great interest from its bulk, brightness, and solidity; the returns to the fortunate owners for some time being £50 per week. Gross weight, troy, 1,740 ozs. 13 dwts.; assay gold per cent. 95·58 carats, gra. 22·34.

**2 JACOBS, SON, & Co.** *Basinghall st. London*.—Cases with fleeces from the flocks of J. L. Curry, Larra, Geelong, and from the flocks of Francis Ormond, Born-yalloak, Geelong.

The export of wool from the Colony of Victoria in 1864, was 39,407,726 lbs. The imports of wool into England from all the Australian Colonies, in the last two years, were as follows, in bales:—

	1864.	1865.
Victoria, . . . . .	119,351	135,513
New South Wales and Queensland, . . . . .	77,484	79,672
South Australia, . . . . .	40,609	45,505
New Zealand, . . . . .	45,017	52,797
Tasmania, . . . . .	17,025	16,082
Western Australia, . . . . .	2,691	2,991
	362,177	332,560

**3 HOOD & Co.** *Melbourne*.—Pharmaceutical preparations.

**4 CLARK, A.** *Melbourne*.—Samples of grain.

**5 BANK OF AUSTRALASIA**.—A collection of gold selected and prepared by the bank assayer, Mr. Pater-son, and bullion clerk, Mr. William Stronach, viz:—Ballaarat alluvial gold—10 ozs. samples from Ballaarat, Bullarook, Creswick, Smythesdale, and Happy Valley; 1½ ozs. nugget from Ballaarat. Beechworth alluvial gold—10 ozs. samples from Beechworth, Chiltern, Yack-andandah, and from Morse's Creek. Castlemaine alluvial gold—10 ozs. samples from Castlemaine, Talbot, and Blackwood. Sandhurst alluvial gold—10 ozs. samples gravel gold; 13 ozs. 14 dwt. 12 gra. sample from White Hills; 10 ozs. sample coarse gold; 10 ozs. samples from Bendigo Flat and Epsom Flat; 7 ozs. 9 dwt. 6 gra. sample from Gas Works; 4 ozs. 1 dwt. sample from Golden Square;

3 ozs. 4 dwt. 12 gra. nugget. New Zealand gold—Two 10 ozs. samples from Dunstan; rough gold 219 ozs. 19 dwts. 6 gra., value £857 11s. 3d. Melted Gold—1 bar 581 ozs. 10 dwts., value £2,281 2s. 6d. sterling; 3 bars 46 ozs. 16 dwts. 12 gra. value £191 8s. 9d.; total value of gold, and duty paid, exhibited by Bank of Australasia, £3,393 15s.

**6 UNION BANK OF AUSTRALIA**.—A collection of samples of alluvial gold.—New Zealand gold, 130 ozs. Victoria gold:—74 ozs. 5 dwts. from Forest Creek, Castlemaine; 11 ozs. from Golden Point, Castlemaine; 15 ozs. from Adelaide Flat, Castlemaine; 50 ozs. from Jones' Creek, Sandy Creek; 51 ozs. from Sandhurst; 200 ozs. from Bonahaw, Ballaarat; 200 ozs. from the Cornella Company, Daylesford; total 731 ozs. 5 dwts., value £2,925.

**7 AMOS, ROBERT,** *Carron Rolling Mills, Melbourne*.—Samples of rolled iron.

**8 BARNARD, MR. WARREN,** *Beechworth*.—Black sand and smelted tin, from Excelsior claim, Reid's Creek.

**9 BLAND, R. H.** *Clunes*.—Quartz with gold and other minerals, from the 300 foot level of the Port Phillip and Colonial Company's workings at Clunes.

**10 BULL, LIEUTENANT-COL.** *Castlemaine*.—Brown Hematite.

**11 BIER, H.**—Five Specimens of Quartz, from Little Bendigo, near Ballaarat.

**12 CLARKE, WILLIAM, JUN.**—Ores of silver, from St. Arnaud's.

**13 CORNWELL, ALFRED,** *Brunswick*.—Glazed earthen-ware, drain pipes, &c.

**14 DERMOTT, Messrs., St. Kilda**.—Specimens of gold and other minerals in auriferous quartz, from Woods Point district.

**15 GIBBS, R. R., Ballaarat**.—Samples taken from Albion Gold Mining Company's Claim, Ballaarat.

No. 1. Box of auriferous wash-dirt.

" 2. Piece of basalt, or 4th rock, immediately above wash-dirt.

" 3. Piece of a tree, about 6 ft. diameter, found amongst the wash-dirt at a depth of 460 ft. Numbers of such trees are met with at these depths. 4. Piece of bed rock.

Samples from Nelson Gold Mining Company, Sebastopol, Ballaarat.

No. 5. Piece of basalt or 4th rock.

" 6. Boulder, taken from among wash-dirt, with gold visible.

" 7. Box of auriferous wash-dirt.

Samples from Scottish and Cornish Gold Mining Company black lead, Ballaarat.

" 8. Piece of cement wash-dirt, with gold visible. Thousands of tons of such material are to be found in the mine, but will not be manipulated for many years.

" 9. Two small nuggets, impregnated with quartz.

**16 GLEW, JOHN,** *Brunswick*.—Terra cotta mouldings, moulded and common bricks, and clay.

**17 HUMPHRAY, J. B.**—Roofing slates.

**18 KELLY, T., Brunswick**.—Drainage pipes.

**19 KNIGHT, J. G., F.R.I.B.A., Melbourne**.—Model of the gold trophy shown in the International Exhibition of 1862, with the addition of a base embodying the quantity of gold obtained in Victoria since the calculations for the construction of the trophy of 1862 were made. Scale of the model, one inch and a half to the foot. The pyramid exhibited in London was designed to show the quantity of gold obtained in the Colony of Victoria, from the 1st of October, 1851, to the 1st of October, 1861, which amounted to 800 tons 17 cwt. 3 gra. 7 lb., of the value of £104,649,728 sterling; this value, reduced to measurement, is equal to 1,492½ cubic feet of gold, and placed in a pyramidal form, it made a figure 44 ft. 9½ in. high, and 10 ft. square at the bottom.

The base now attached to the model pyramid embodies

the quantity of gold obtained in Victoria from the 1st of October, 1861, to the end of 1864. This amounts to 223 tons 10 cwt. 1 qr. 8½ lb., of the value of £29,211,980 sterling; in bulk, equal to 416 ft. 7½ in. cube; which, at full size, would add a base to the original pyramid 10 ft. 2 in. square, and 4 ft. 0½ in. high. The gross weight of gold produced from the mines of Victoria in little more than thirteen years is 1,024 tons 8 cwt. 0 qr. 15½ lb.; of the value of £133,861,708 sterling! The mines of Victoria are now in a more prosperous condition than they have been for some years past.

20 KNIGHT, J. G., *Melbourne*.—Collection of colonial building stones, and treatise thereon

21 LANG & CO., *Melbourne*.—Samples of "Geelong" and "Heads" limestone.

22 LATHAM & WATSON, Messrs. *Sandhurst*.—23 Specimens of quartz, with gold associated with galena, blende, and various forms of the sulphides of iron. These specimens are taken from depths varying from 70 to 400 feet.

23 LATROBE TIN MINING COMPANY.—Samples of tin ore passed through sieves.

24 LYONS, J. C., *Ballaarat*.—Samples of Lignite fuel and manures.

25 MACILWRAITH, J., & Co., *Melbourne Lead Works*.—Samples of sheet lead and pipes.

26 MARKS, GEORGE, *Creswick-road, Ballaarat*.—Drain pipes and pottery.

27 NANKIVELL, Mr., *Mining Surveyor, Maldon*.—Granite and water-worn quartz crystals from Maldon.

28 O'MALLEY, MICHAEL, *Mining Surveyor, Ballaarat*.—Nugget from Band of Hope Claim, weight about 31½ ozs. Nugget from Scottish and Cornish Company's Claim, 1½ ozs., 4 small specimens, 2 very small do., and two pins of gold.

Samples of auriferous wash-dirt from Prince of Wales Company's Mine, *Ballaarat*. From United Extended Band of Hope Company, *Ballaarat*. From Nelson and Wellington Company, *Ballaarat*. From Albion Gold Mining Company.

Specimens of "cement" and "wood" from the Scottish and Cornish Gold Mining Company.

Specimens of "quartz" and "cement" from Alston and Weardale Company, *Ballaarat*.

Quartz from Staffordshire Reef, near *Ballaarat*.

Collection of miscellaneous specimens.

29 STRONG, Mr. *Mining Surveyor*.—Ores of antimony, from *Heathcote*.

30 BOARDMAN, PIERCE, *Nunawading*.—Samples of essential oils:—No. 1. *Eucalyptus amygdalina*. Can be produced wholesale at 3s. per lb. 1 cwt. of leaves and twigs yield 22 oz. of oil.

No. 2. *Eucalyptus corymbosa*. Wholesale price, 6s. per lb. 1 cwt. of leaves and twigs yield 9 oz. of oil.

No. 3. Oil of Caraway. Distilled from imported seed. No. 4. *Melaleuca ericifolia*. Price about 20s. per lb. 1 cwt. of leaves and branchlets yield 4 oz. of oil.

No. 5. Oil of peppermint. Distilled from English peppermint grown in the colony. Price 40s. per lb.

*Essential Oils from Indigenous Plants, adapted for use in Medicine, Perfumery, &c.*—Under this heading all the oils obtained from the genera, *Eucalyptus*, and *Melaleuca* might be enumerated, inasmuch as they are all possessed of medical properties. In this respect it is probable that they differ from each other only in degree, and that essentially they will all be found to act as diffusible stimulants, anti-spasmodics, and sudorifics, greatly resembling the oil of cajuput, to which they are closely related botanically, and which they approach so nearly in their physical and chemical properties.

*Atherosperma moschata* (native *Sassafras*).—This beautiful tree requires a humid soil and climate, and is met with in the fern tree gullies of Victoria and Tasmania, sometimes in considerable abundance; it attains in such localities the dimensions of a middle-sized tree. The bark is now recognised in Victoria as a useful addition to the *Materia Medica*, and is rising in the estimation of

medical men. It contains an essential oil, obtainable by distillation, which acts with great energy upon the vital functions; the manufacture of which, in quantities, is now regularly prosecuted. It is sold for about 15s. per ounce.

The oil has a thin unctuous consistence, and a rich yellow colour when first distilled, deepening to a yellowish-brown by age. Its smell is oppressive and disagreeable, resembling that of the *sassafras* oil of commerce, whence the popular name of the Victorian tree, with an admixture of oil of caraway. Its taste is aromatic and rather agreeably bitter, producing a local prickling sensation upon the tongue, which lasts for some time. This oil is heavier than water, its specific gravity being 1.04, and its boiling point is very high, namely, 446° F.; the mercury continuing to rise until it reaches 473°. It burns, under all circumstances, with a very smoky flame. The physiological effects of of this oil in small doses are described as diaphoretic and sedative, and it appears to exert a specific lowering influence upon the heart's action. As a medicine it has been introduced into the hospitals, and employed in cases of heart disease; the dose being one drop administered at intervals of six or eight hours. In large quantities it must be regarded as a dangerous poison. Rubbed externally upon the skin, it does not, like myrtaceous oils, act as a rubefacient or irritant.

In the preparation of this liquid the bark is reduced—if possible while it is yet green—to small shavings or chips; 100 lbs. of these when dry yield 18 ounces 6 drachms. The leaves of the Victorian *sassafras* also yield an essential oil, of which as yet no examination has been made.

*Prostanthera lasiantha*.—This species of *Prostanthera* is widely distributed, and is one of the most common of the smaller trees met with in the forest valleys of Victoria and Tasmania, as also in a portion of New South Wales. The oil is produced from the leaves, which, should its medical properties bring it into request, could, without difficulty, be obtained in large quantities for distillation. The oil is a limpid, greenish-yellow fluid, of a mint-like odour, and rather mild mint-like taste; the after taste is not disagreeable. The specific gravity of this fluid is 0.912, and the yield from 100 lbs. of fresh leaves is 2 ounces 4½ drachms.

*Prostanthera rotundifolia*.—This plant is of a shrubby character, and is not so common as that which has just been noticed. It yields an oil which resembles that from the *P. lasiantha* both in smell and taste. In colour it is darker, and its specific gravity is also considerably higher, being 0.941. The yield from 100 lbs. is 12 ounces.

*Mentha Australis*.—This plant and the two following are true mints; they do not exceed the size of herbs or half shrubs. They are all available in very considerable quantity in Victoria, and are also found in New South Wales, Tasmania, and South Australia. Of the *Mentha Australis* three samples of oil were forwarded to the London Exhibition of 1862. It is procured by the distillation of the herb; and as the leaves do not constitute more than one-fourth by weight of the whole, its productiveness must be regarded as tolerably considerable. The yield is variously stated. Owing to the smallness of the quantities produced the specific gravity of this oil could not be determined. In taste and smell this oil hardly differs from ordinary oil of peppermint, but it may be described as somewhat coarser than the best samples of that substance. This oil would undoubtedly be a saleable commodity in Australia, for the use of the druggist and confectioner, in place of the imported peppermints, some of which suffer adulteration to a large extent.

*Mentha grandiflora*.—This mint has a fiery, bitter, and very unpleasant nauseous taste, together with the characteristic after taste. It could not be used as a substitute for common peppermint, except for medical purposes. Its specific gravity is 0.924, and its yield five ounces from 100 lbs. of the fresh herb.

*Mentha gracilis*.—The herb from which this oil is produced contains a portion of its volatile oil in the stems; the total yield from 100 lbs. of the green plant being 3 ounces. In its properties this oil resembles the *M. Australis* more closely than the *M. grandiflora*. Its smell is like oil of peppermint, with a slight admixture of pennyroyal. Its taste is very diffusible, but less pungent than the official oil. There can be no question that for medical purposes the three oils of the genus *Mentha*, which have been described, would prove to be carminative stimulants like the European species, *Zieria lanceolata*. The supply of oil from the leaves is tolerably copious; 100 lbs. of the fresh green shrub, inclusive of branchlets, furnishing 5½ ounces of a pale yellow limpid oil, the odour of which is hardly distinguishable from that of the oil of rue, though, perhaps, a little intense and penetrating. Its taste is very disagreeable and acrid, strongly resembling that of rue. The medicinal action of this oil is that of a diuretic and diaphoretic.

*Eriodendrum squameum*.—The oil from this shrub resembles that of the preceding, but is less disagreeable and more aromatic both in taste and smell, and is in these respects also preferable to oil of rue. 100 lbs. of the freshly gathered leaves and branchlets yield 4 ounces of pale yellow oil.

*Pittosporum undulatum*.—The essential oil from the blossoms of this plant is a limpid colourless fluid, lighter than water, of an exceedingly agreeable odour, resembling the perfume of jasmine flowers. Its fragrance is best developed by solution of a small quantity of the oil in dilute alcohol, in which it is but sparingly soluble. In taste this substance is disagreeably hot and bitter, with a slight trace of the flavour of the oils of turpentine and rue. Iodine, when brought into contact with it, gives rise to an explosion. Irrespective of the odour which the blossoms of this plant exhale, it is a highly ornamental bush, which would flourish well in the South of France, and the distillers of essences and perfumes in that country might cultivate it with great advantage, as it is easily raised from seed, blooms with great profusion, and would afford a new and agreeable perfume. This species of *Pittosporum* is the most likely to be of practical importance; its leaves yield a very bitter extractive principle, as in a still higher degree do also those of the *P. phylliroides*.

31 BOSISTO, JOSEPH, *Richmond*.—Essential oil of *E. Amygdalina odorata*. This oil is now being supplied to the London market through Messrs Grimwade, Ridley, & Co., Great St. Helen's, London.

Essential oil of *Cortex Atherosperma moschata*.—The physiological effects of this oil, in small doses, are described as diaphoretic, diuretic, and sedative, and it appears to exert a specific lowering influence upon the heart's action. As a medicine it has been introduced into the colonial hospitals, and employed successfully in cases of heart disease. Administered in one or two drop doses at intervals of six or eight hours.

Essential oil of *Folia Atherosperma moschata*.—Mild and fragrant. Its physiological effect, weak in comparison with that obtained from the cortex.

Essential oil of *Melaleuca cricifolia*, or Australian *Cajeput*. Equal in effect to the oil from *Melaleuca Leucadendron*.

Gum *Eucalyptus Amygdalina odorata*, and *fabro-rum*.—Soluble in water, and possessing valuable tanning properties. Quantities could be shipped.

Gum *Eucalyptus rostrata*, or red gum.—Valuable as a medicinal astringent.

*Xanthorrhæa Australis*, or Grass Tree Resin.—Soluble in spirit, leaves a bright red polish on wood, when used as French polish; contains cinnamic and benzoic acids; the action of nitric acid upon the gum gives rise to picric acid. The gum will possibly be found useful for dyeing scarlet, &c. Large quantities can be forwarded.

Balsam of *E. Amygdalina odorata*.—Obtained from the leaves after distillation.

*Bacca Drimys aromatica*, or Australian pepper.

*Senecio Bedfordii*.—The white flock shown is obtained from the under part of the leaves of the above named plant. The yield of flock is one ounce from one pound weight of the green leaves. This substance is easily obtained from off the leaves by means of a brush, and extensive supplies are obtainable. Its value to manufacturers of paper, &c., per cwt. would require to be known.

32 BEVERIDGE, P. *Murray*.—Resin of *Callitris verrucosa*. Of the resins proper two representatives only, the products of indigenous trees, are at present known to exist in Victoria, namely, that from the *Callitris verrucosa* and *cupressiformis*, and from the *Xanthorrhæa Australis*. The first mentioned resin from the two trees commonly known as the desert and mountain cypress pine, may be collected in the northern and north-western parts of the colony in considerable abundance. It exudes naturally from the bark in tears, or small pendulous masses, and also flows from incisions made to encourage exudation.

This substance may be described as a resin of excellent quality, almost identical with the best samples of sandarac, from the *Callitris quadrivalvis* of the Mediterranean, so largely used in the manufacture of varnishes. It is a transparent, colourless, or pale yellow body, fragrant and friable, fusing at a moderate heat, and burning with a large smoky flame, very soluble in alcohol and the essential oils, and almost totally so in ether; turpentine at ordinary temperature does not act upon it, nor do the drying oils, but it may be made to combine with those solvents by previous fusion.

The balsamic resin from the *Xanthorrhæa Australis* is a subject of much interest. It is found in masses of irregular globular shape within the body of the tree, and exuding in large tears and drops near its roots. It is a dark red friable substance, the purer homogenous specimens exhibiting a most brilliant ruby colour when crushed into fragments; it fuses readily, with the same deep colour, and exhales the characteristic odour of gum benzoin and dragon's blood under such circumstances. In many respects it resembles the last named substance, but its solutions are less intensely red, inclining to yellow, while as a varnish it has much more body and gloss. When grass-tree gum is ignited it burns with considerable energy, and its destructive distillation gives rise to liquid as well as solid products, which have not as yet been investigated. It is very soluble in alcohol, and in the essential oils from the eucalypti; that from the Dandenong peppermint (*E. amygdalina*) proving an exception. Ether takes up a portion only, leaving behind a resinous substance coloured more intensely red than that which it dissolves; turpentine exercises no solvent action upon it, and the drying oils but very little.

The *Xanthorrhæa Australis* is very common in many parts of Victoria; in some healthy localities, as in Gipp's Land, covering tracts of many square miles in extent; and the resin, were its uses properly investigated and determined, and thereby drawn into technical use, might be collected in very large quantities.

A very interesting discovery of fossil resin has been made by Mr. Richard Daintree, of the Victorian Geological Survey, in the tertiary lignites of the Bass River, in the Western Port district. This remarkable substance was obtained at a depth of about fifty feet below the surface; the formation in which it occurs is of great extent, but not sufficiently explored at present to enable an estimate to be made of the probable quantity of resin available. Like many fossil substances of this class, the resin from the Bass River is not easily dissolved in the ordinary menstrua; alcohol and ether take up a portion of it, the former giving rise to a brown coloured solution, leaving the insoluble remainder in a swelled and bleached state; the latter forms a clear colourless solution, which by evaporation leaves a pure white residual resin. Turpentine does not exert any solvent power, while the essential oils from Victorian myrtaceous trees appear to be its best solvents, as only a small insoluble portion remains after their action,

consisting to a great extent of mineral impurities. This resinous body appears in small rounded masses, somewhat translucent internally, but possessed of a rough opaque covering; its colour is a pale brownish grey, with a glassy fracture, it is very friable and inflammable. On being heated it fuses with the disengagement of much volatile matter, causing a frothiness that does not subside for some time. It is less fragrant under these circumstances than the fossil resin of New Zealand, the odour resembling that of sandarac, a circumstance leading to the opinion that the substance was originally the produce of a tree allied to the genus *Callitris*. It burns readily, leaving unconsumed a quantity of bright and bulky charcoal.

The genus *Acacia* furnishes several true gums, of which those from the species *A. mollissima*, *A. dealbata*, *A. pyramantha*, and *A. homalophylla* are the most important. These substances exude from the trees as do the Arabic gums of commerce, and occur in rounded or irregularly formed masses, at times almost colourless or pale yellow, but not unfrequently tinged with red or brown. Some samples are occasionally so intersected with an infinite number of cracks as to present an amorphous white appearance. Generally speaking, the Victorian *acacia* gums are less soluble than the gum Arabics of commerce; but, on the other hand, they appear to yield a more adhesive mucilage, which is less liable to splinter and crack when dry. Most of these bodies possess a slight amount of astringency, which varies in one and the same sample from a single tree; and it would seem that while this peculiarity is absent, or but very faintly perceptible in the pale-coloured pieces, it increases in proportion as the colour of the gum deepens, a circumstance which would much facilitate their classification.

Under the term gum-resin, a numerous series of indigenous vegetable productions may be classed which could be procured in great abundance in Victoria, but which have not hitherto received the attention they deserve. They are produced in greater or lesser quantities by all the species of the genus *Eucalyptus*, and might be largely accumulated with little trouble by splitters and sawyers throughout forests of the country.

These substances occur within the trunks of trees of all sizes, in flattened cavities in the otherwise solid wood, which often lie parallel to the rings of growth. In such places the deposition of gum—which is at first a viscid liquid, becomes gradually inspissated, and subsequently hard and bitter. The liquid gum may also be obtained by suitable incisions in the stems of growing trees; but whether such a method affords greater facilities for its collection than those naturally offered, appears to be still an undecided question.

In their general characteristics the gum-resins from the *Eucalypti* resemble each other very closely. When in the solid form they present the appearance of small angular masses, intermixed with occasional striated pieces and particles of wood. The prevailing colour is dark red-brown, in some cases dull, with olive and yellowish tints; in others bright ruby-coloured and transparent; black and opaque pieces are also very commonly found interspersed through each of the several descriptions of gum-resin.

The fracture, when these substances are thoroughly dried in the water bath, is vitreous, and they are, moreover, then exceedingly friable, and easily pulverized. Desiccation in this way causes them to lose from fifteen to twenty per cent. of their weight.

In the mouth they are tough and adhesive to the teeth, colouring the saliva red; their taste is intensely astringent, without much bitterness; although it should be remarked that in this particular they are not all equally potent.

The liquid gum resins are very viscid treacle-like fluids, which do not differ in chemical constitution from those which have undergone induration, save that they contain about sixty-five per cent. of water, capable of being expelled by the temperature of a water-bath.

The solvent action of water on these bodies is not the same in the case of gums from different species of trees. If, for instance, cold water be poured on the produce of the *E. corymbosa*, whether it be in the solid or liquid state, a portion only is taken up, while the gum from the stringy bark is completely dissolved.

When, as in the case first cited, a flocculent residue remains after the action of water, a few drops of ammonia render the solution perfect.

The aqueous solutions of the *Eucalyptine* gum-resins all give an acid reaction with test paper; but the differences in the behaviour of each, when dissolved by water, subjected to the several re-agents, become very manifest. The precipitate caused by a solution of gelatine—indicative of tannic acid—does not appear in any case to correspond in quantity with their intense astringent taste; and occasionally the addition of that substance causes no precipitate at all. This fact has an important bearing upon the value of this whole class of bodies under consideration for tanning purposes, and as substitutes for catechu and similar bodies.

With acetate of lead these astringent bodies give copious gelatinous precipitates, and with the salts of iron various shades of green and black. The mineral acids also determine in them bulky flocculent deposits.

One or more of the substances which have been made the subject of the foregoing very imperfect sketch appear to have been forwarded from these colonies from time to time, in small quantities, to Great Britain, and to bear there the name of Botany Bay kino; but, little seems to be known respecting their properties or uses, the general belief being that Australian kino is only furnished by the iron-bark tree (*E. resinifera*). It becomes, therefore, the more necessary to follow up this subject to a conclusive termination, to establish by a searching chemical investigation the proper uses of substances so abundantly available, and thereby increase the industry and prosperity of the land.

33 CONNOR, DAVID.—Gums of *Eucalyptus odorata* (peppermint), *Eucalyptus fastidiosa*, resin of *Xanthorrhoea australis*. Sample of "stringy bark," believed to be capable of making coarse paper.

34 FELTON, ALFRED, Melbourne.—Victorian blue, yeast powder, curry powder, flavouring essences.

35 HALL, J. Western Port.—Sample of arrow root.

36 HART, THOMAS, Caulfield.—Acacia wattle galls.

37 HOOD & CO. Melbourne.—Collection of chemicals.

38 HOBSON'S BAY SOAP AND CANDLE COMPANY, Melbourne.—Box of soap, No. 1, ditto No. 2, ditto "Marbled," ditto "glycerine bars," ditto "tablets." Samples of purified tallow and candles.

39 MUELLER, DR. F.R.S. Melbourne.—Gum of *Eucalyptus amygdalina*, resin of *Eucalyptus obliqua*, bark of *Atherosperma moschata* (sassafras).

40 MACDONALD, C. Parepa.—Sample of curing-salt from Lake Bolae.

41 MACMEIKAN, JAMES, & Co. Flemington Bone Mills, Melbourne.—Superphosphate manures, "charcoal puff," coal dust, &c.

Macmeikan and Co.'s artificial manures have stood the test here for some nine years and received the gold medal at the Great International Exhibition, London, for 1862, as well as a first-class certificate awarded by the Commissioners of the Victorian Exhibition, 1862, which places their manures second to none in the world.

Their bone dust, now so favourably known, being prepared from bones steamed in close vats, as recommended by Professors Johnston, Stockhardt, and the agricultural societies of Great Britain, is therefore ground much finer; and years of experience have proved that bones so prepared are much more prompt and vigorous than crude bones. For this reason it is more valuable to the farmer and gardener.

Superphosphate of lime, £10 per ton. Bone dust, £6 10s per ton—bags included.

42 SLATER, W. H. Nanawading.—Collection of essential oils, poppy heads, damask rose leaves, grown for distillation.

- 43 ALLAN & BALDREY, *Wangaratta Steam Flour Mills*.—Sample of silk-dressed flour.
- 44 ANDERSON, WILLIAM.—Wheat grown at Smeaton.
- 45 BUCHANAN, JAMES, *Berwick*.—Purple straw wheat.
- 46 CONNOR, J. H. *Colac*.—Spring wheat, white Winter wheat, and skinless barley.
- 47 COULSON, ELIJAH, *Colac*.—Sample of wheat.
- 48 CLARK, A. & Co. *Melbourne*.—Spring wheat, golden drop potato oats, malting barley.
- 49 COFFEY, JEREMIAH, *Spring Hill, Crenwick*.—Sample of wheat, weight 68 lbs.
- 50 DYER, ROBERT, *Coghill's Creek*.—Tartarian oats, grown on chocolate soil, 44½ lbs. per bushel.
- 51 DEWAR, WM. *Gisborne*.—White Tuscan wheat.
- 52 DEWAR, JOHN, *Gisborne*.—White Tuscan wheat.
- 53 FOORD, J., *Steam Flour Mills, Wahgunyah*.—Silk dressed flour.
- 54 GRAHAM, JOHN, *Wahgunyah Plains*.—White Tuscan Wheat, 67½ lbs. per bushel; white Lammas wheat, 68 lbs. per bushel.
- 55 GOUGH & Co., *Melbourne*.—Malting barley and colonial malt.
- 56 HANCOCK, A. P. *Warriors, pear Colac*.—Tuscan wheat, grown on vulcanized soil, sown July, 1864, harvested January 2nd, 1865.
- 57 JUNOR, DAVID, *Gisborne*.—Tartarian oats.
- 58 M'LAREN, WILLIAM, *Gisborne*.—Half-bushel sample of perennial rye-grass seed.
- 59 MAUNDER, G. *Barnawatha, Ovens District*.—White Lammas wheat, 40 bushels to the acre, sown 28th May, reaped 17th December, 1864.
- 60 MATTHEWS, WM. *Coghill's Creek*.—Red Tuscan Wheat, grown on chocolate soil, 45 bushels per acre, weight 66½ lbs.; potato oats, yield 45 bushels per acre, weight 50½ lbs.
- 61 OVENS & MURRAY AGRICULTURAL SOCIETY.—Sample of wheat, 68½ lbs. per bushel; sample of wheat, 67½ lbs. per bushel; 2 samples of oats, and 2 of flour.
- 62 OFFICER, JOHN, *Tower Hill, County of Villiers*.—2 samples of wheat.
- 63 REYNOLDS, J. N. *Melbourne*.—Samples of potato oats and barley.
- 64 SHEEDY, M. *Gisborne*.—White Tuscan wheat.
- 65 THOMPSON, JOHN, *Bullingarook*.—White Tuscan wheat.
- 66 AERATED BREAD CO. *Melbourne*.—Sample of bread.
- 67 BENCRAFT, GEORGE, *Melbourne*.—Prize oatmeal, groats, and patent barley.
- 68 CASARA, RAVENNA, & Co.—Maccaroni, vermicelli, and semolina, and sample of hard wheat from which it is made.
- 69 FORDHAM, FRANK, *Emerald Hill*.—Assorted oilman's stores; pickles, sauces, jams, fruits, &c.
- 70 SMITH & SON, *Fitzroy*.—Case of assorted biscuits.
- 71 SWALLOW & Co., *Sandridge*.—Sample of ship bread.
- 72 URIZ, MUNN, & YOUNG, *Melbourne*.—Australian maizena and starch.
- 73 BIGNELL, H. *Melbourne*.—Tierce of mess beef; nents-foot and trotter oils.
- 74 CROFTS, J. *Melbourne*.—Colonial cheese and butter.
- 75 WATSON & PATERSON, *Northcote*.—2 tierces of mess beef; 1 side of bacon.
- 76 DILLON & BURROWS, *Melbourne*.—Case of confectionary.
- 77 VICTORIA SUGAR CO. *Sandridge*.—Samples of sugar, treacle, white spirit, and rum.
- 78 AITKEN, THOMAS, *Melbourne*.—1 kilderkin of ale; samples of bottled porter and whiskey.
- 79 BURKE, T. D. *Melbourne*.—Case of porter.
- 80 DUNN, ROBERT, & Co. *Warrenheip Distillery*.—1 case colonial whiskey; 1 case gin.
- 81 MARTIN, P. J. *Melbourne*.—Ale and stout.
- 82 THUNDER, ANDREW, *Sandhurst*.—Case of porter, made from colonial malt.
- 83 WILD, EDWARD, *Collingwood*.—1 case of pale ale; 1 cask stout.
- 84 DARDEL, *Geelong*.—Samples of wine.
- 85 DUNOYER, J. *Geelong*.—Samples of wine.
- 86 EVERIST, J. T. *Hawthorn*.—Samples of wine.
- 87 FALLON, J. F. *Albury*.—Samples of wine.
- 88 KLEMM, F. O. *Sandhurst*.—Samples of wine.
- 89 MAPLESTON, C. *Irishhoe Lodge*.—Samples of wine.
- 90 PETTAVEL, D. *Victoria and Prince Albert Vineyards*.—Samples of wine.
- 91 RAY, HENRY, *Albury*.—Samples of wine.
- 92 SCHUBACH, SEBASTIAN, *Albury*.—Samples of wine.
- 93 WEBER, BROTHERS, *Batesford*.—Samples of wine.
- 94 LOUGHNAN, BROTHERS, *Melbourne*.—Colonial-grown and manufactured tobacco.
- 95 MOSS, WHITE, & Co. *Melbourne*.—Samples of cigars manufactured from imported leaf.
- 96 OWEN, DUDGEON, & ARNELL, *Melbourne*.—Samples of colonial grown and manufactured tobacco, and tobacco and snuff's manufactured from imported leaf.
- 97 TODT, T. Surveyor-General's Department, *Melbourne*.—A collection of casts of about fifty fruits, vegetables, and roots, modelled from nature, and coloured, by the exhibitor.
- 98 CUNNINGHAM & MACREDIE, *Melbourne*.—Twenty-four fleeces of wool, from the Intercolonial Show held in Melbourne in 1864, viz.:—Blair, J., 1 fleece; Currie, John L., 3 fleeces; Cumming, John, 2 fleeces; Cumming, T. F., 2 fleeces; Degraives, Wm., 1 fleece; Kermode, R. Q., 2 fleeces; M'Kellar, David, 1 fleece; Learmonth, T. S., 3 fleeces; M'Knight & Irvine, 2 fleeces; Ormond, Francis, 2 fleeces; Russell, P., 3 fleeces; Robertson, A. S., 1 fleece; Wilson, J. W., 1 fleece.
- 99 ACCLIMATIZATION SOCIETY OF VICTORIA, *Melbourne*.—Samples of alpaca and Angora goats' hair.
- 100 TIMBRELL, Mrs. ANN, *Briabane*.—Samples of spun silk and cocoons, with a treatise on the culture of the silkworm in Australia; sheepskin imitation wicker basket and flower-stand.
- 101 ALCOCK & Co. *Melbourne*.—Polished slab of blackwood (*Acacia melanoxylon*); half polished slab of myrtle wood (*Acmena floribunda*); specimens of turnery in myall wood, &c.
- 102 ARNOLD, C. *Melbourne*.—Several cases of scented myall wood pipes.
- 103 ANDERSON & WRIGHT, *Melbourne*.—Sample planks of red gum, blackwood, stringy bark, and box-wood timber.
- 104 MUELLER, Dr. F.R.S. *Melbourne*.—A small collection of colonial woods.
- 105 ROBERTS & FORD, *Melbourne*.—Turned myall wood candlestick; ladies' thread stand.
- 106 SWINDOORN, J. *Melbourne*.—Machine-wrought mouldings.
- 107 PERRY, J. *Melbourne*.—Colonial bent woods.
- 108 COBAIN, J. *Salé*.—Flax.
- 109 CHAMP, Colonel, *Pentridge*.—Cabbage tree hats; blankets and rugs.
- 110 DAVIS, FINLAYSON, & HUTCHERSON, *Melbourne*.—Woollen socks.
- 111 READ, J. C. *Wahgunyah*.—Native flax, roughly prepared.
- 112 THOMSON & HILL, *Melbourne*.—Woollen socks.
- 113 ZEVENBROOM, J. *Melbourne*.—Colonial-made brushware.
- 114 LENNON, H. *Melbourne*.—Model of an improved plough.
- 115 CLERK & SON, *Melbourne*.—Leather.
- 116 M'FARLANE & SON, *Melbourne*.—Stockrider's whip made of Kangaroo skin, and pair of saddle girths.
- 117 DILLON, J. *Footscray*.—Native cat skins prepared for furriers' use.
- 118 ROBERTSON, J. *Melbourne*.—A case of dyed emu feathers, in 24 colours.
- 119 GALVIN, J. *Melbourne*.—Light hats of colonial manufacture.
- 120 MEALY, Miss E. *Collingwood*.—Straw plaiting.
- 121 ABBOT, E. *Tasmania*.—The Australian cookery book.

- 122 FERRES, J. *Melbourne*.—Specimens of printing and bookbinding.
- 123 ARCHER, W. H., *Registrar General of Victoria*.—Statistical summary of the progress of the Colony of Victoria to the year 1885; statistical tables.
- 124 LETHBRY, Mrs. *Footscray*.—Colonial leather work, and seaweed.
- 125 MURPHY, M. *Melbourne*.—Colonial made port-manteau.
- 126 CORNELL, F. *Melbourne*.—Photographic views.
- 127 LIGAR, C. W. *Victoria*.—Specimens of Osborne's process of photo-lithography; model maps of Victoria.
- 128 NETTLETON, C. *Melbourne*.—Twenty Photographic views of Melbourne, &c.
- 129 SELWYN, A. R. C. *Government Geologist*.—Progress Geological map of Victoria.—(*In passage near Water Colour Room*.)
- 130 CUTOLO, Signor, *Melbourne*.—Music composed by exhibitor.
- 131 SANDS AND M'DOUGALL, *Melbourne*.—Books published in Victoria.
- 132 COLE, B.—White peas.
- 133 GRANT, C. & J. *Mount Beckwith*.—Potato oats.
- 134 KINNERSLEY, D. *Learmonth*.—Purple straw wheat.
- 135 STEWART BROTHERS, *Learmonth*.—Tartarian oats.
- 136 VALLANCE, W.—Sandy oats.
- 137 DICK, W. B.—*Lochgelry, Fifeshire, Scotland*.—Grain grown in Victoria.
- 138 ROWE, J. P. *Terrick*.—Two bales of wool.
- 139 CHEESLEY, JOS. *Surrey Farm, Indigo County, Owens District*.—Golden Orange wheat 62½lbs. per bushel.
- 140 ANDERSON BROTHERS.—White Tuscan wheat, 67½lbs. per bushel.
- 141 CRAIG, J.—Sample of flax and flax seed.
- 142 COX, W. *Lancefield*.—Malting barley, 58½lbs. per bushel.
- 143 HALL, *Williamstown*.—Indian corn and bean pods.
- 144 IRVING, J. L. *Elizabeth st. Melbourne*.—Samples of oats.
- 145 LAW, SOMNER, & Co. *Melbourne*.—Golden tares; peas; soft grass seed; Californian prairie grass.
- 146 ORLEBAR, Mr. *Allanford, Warramboul District*.—Red straw wheat; choose.
- 147 LEARMONTH, T. *Excildown*.—Hops grown in 1864 and 1865.
- 148 TURNER, J. H. *Melbourne*.—Washed wools.
- 149 WRIGHT T.—Cape barley.

## FOREIGN DEPARTMENT.

### *Sketch of a Continental Tour on behalf of the Exhibition.*

BY HERCULES MACDOWNELL, Esq., one of the Executive Committee.

BUT twelve months to accomplish an International Exhibition! The idea was almost sublime from its very audacity. There was before us but that short time to make the project known throughout the world, wherever Art and Industry exist, to disarm jealousies and distrust, to harmonize conflicting nationalities, to persuade, collect, organize, and arrange. Such a prospect must either crush the projectors in despair, or awaken their energy to the most active exertion. The only question asked was, is it possible? If so, it must be attempted.

The solution of this question could only be learned from the great Continental States. With their aid all might be accomplished; without it, the Exhibition might, indeed, gather a brilliant collection within its walls, but would fail to be international. To ascertain the probabilities at once, the Executive Committee requested me, in May, 1864, to visit Paris, as the best centre for enquiring into the views of continental exhibitors—in fact, as a favourable point whence to make a *reconnaissance en force*. Even this preliminary trip involved preparation and delay. Many questions would be put on the part of foreign exhibitors that did not arise at all in the British department. Some special inducements and facilities should be offered to those who were asked to send from vast distances with slight prospect of advantage; and general principles should be laid down to guide my statements on such points. It was also prudent to have the benefit of the suggestions of those who had earned experience in the great Exhibition of 1862; but, above all, it was indispensable to obtain such official recognition from the British Government as should secure the aid of our representatives abroad, and induce foreign governments in turn to announce the Exhibition of 1865 as worthy their national support.

The application to the Foreign Office, through Earl Russell, involved a delay in London, that enabled me to receive valuable advice and information, placed in the fullest and kindest manner at my disposal. All seemed anxious to aid in a work with which they fully sympathised, but all doubted the practicability in so short a time. I was constantly told that the world was tired of Exhibitions, the public of paying to see them, the governments of paying to aid them, the officials of paying attention to their demands, and, above all, the exhibitors of paying expenses, and being repaid by endless disappointments. All this, probably, was true, but I felt that the bare possibility of success was enough to justify the attempt, and might, by energy, be converted into more hopeful prospects.

FRANCE.—It was the beginning of June, 1864, when Mr. Gilbert Sanders and I, at length, found ourselves at the Hotel du Louvre. A day was lost to us—when every hour was precious—in the general excitement of the great race, when the whole of Paris rushed to the Bois de Boulogne to exult in the almost national triumph of a French horse over the English winner of the Derby! As soon as possible we consulted Lord Cowley, the British Ambassador; Mons. Le Play, the head of the French Exhibition in 1855; Mons. Trescat, of the Conservatoire des Arts et Métiers; the Comte de Nieuwerkerke, Surintendant des Beaux Arts; the well-known economic writers Mons. Michel Chevalier, and Mons. Cappe, who had experience as agent in 1862, besides eminent exhibitors and such others as were likely to reflect most truly the general opinion. The same objections, as in London, were made to daunt us, but in vain; for all admitted that if the Exhibition were once *en train*, and received the indispensable stamp of official recognition, French industry would be not inadequately represented.

By Lord Cowley's assistance we obtained a formal interview with Mons. Béhic, Minister of Commerce. We gave an account of the plans and proposals of the Committee, and explained that we asked only for the recognition and encouragement of the French Government, and not for any pecuniary aid. This evidently at once placed us in a favourable light. We then requested to have our French prospectus printed in the official newspapers, and copies transmitted by the Minister, with his recommendation, to all the various *Préfets* and Chambers of Commerce. We added that the Executive Committee would defray the transport of goods from, and back to, whatever port in France might be selected as most convenient. His Excellency enquired minutely into every circumstance, and finally promised to grant what was sought, subject to the Emperor's approval, as soon as the expected despatches should be received from Earl Russell. He also promised to recommend a reduction in the railway tariff throughout France for exhibitors.

We next saw the Emperor's High Chamberlain, the Duc de Bassano, who informed us that his Majesty was at Fontainebleau, and that I should remain some time at Paris if I wished to have the honour of an audience; but that the subject was one in which the Emperor took a lively interest, and that our statement, letters, and information would be carefully read by his Majesty, who was disposed to encourage to the utmost all such useful enterprises.

Finding thus the testimony of the best informed to agree favourably in its general effect, there appeared sufficient ground for proceeding. France was undoubtedly the most important nation to enlist on our side. It is no vain boast that makes Paris call itself the centre of civilization; the opinion and example of both the Tuileries and the Boulevards impress powerfully all other governments and nations.

On the 11th of June Mr. Sanders proceeded to Brussels, to make a similar *reconnaissance* there, whilst I remained in Paris, amongst other things, for an audience with Prince Napoleon, who had just arrived. Not only was the Prince's influence on such subjects supreme with the government, but he had devoted more attention to them than probably any other person in France; his position and knowledge placed him at the head of all great industrial movements, and his energy and capacity for work made his co-operation of the utmost value. He entered into every detail in a manner that proved his experience, pointed out the difficulties, suggested the necessary steps, promised his hearty co-operation amongst his countrymen, and expressed his intention to visit Dublin in 1865, after the opening of the Exhibition—an intention which he afterwards carried out.

On my return to Dublin the Executive Committee decided on canvassing the other countries of Europe, and requested me to make a tour for that purpose. This required more deliberate preparation. I felt it would not be sufficient to present myself with a merely official sanction from the Foreign Office. It would be fatal to be regarded as something like a paid *commissionaire*, whose representations would have no weight. It was necessary to be brought into more friendly relations with influential persons abroad; I should have the power of entering into that more easy and persuasive conversation accorded only to one who is presented as an acquaintance rather than an envoy, and who is certified to be merely one out of the many gentlemen who devote time and money to forward a work of public importance. Experience afterwards proved that without this precaution precious time would have been lost in loitering about the outskirts, instead of penetrating straight to the centres of influence and action. Accordingly, I was provided with an ample sheaf of introductions, amongst others from the then Lord Lieutenant, the late Earl of Carlisle; from the Duke of Leinster, Lord Clarendon, Lord Granville, M. Van de Weyer, Lord Cowley, Archbishop Cullen, and Mr. P. C. Owen, of the South Kensington Museum. Mr. Owen's extensive acquaintance with persons and facts abroad enabled him to furnish me, as it were, with a valuable chart for my guidance in this novel and complicated navigation.

A more laborious preparation was the collection of knowledge, or perhaps the divesting myself of ignorance as to that which amateur travelling had not taught, the industrial and

commercial resources of each nation. It would have been presumptuous to present myself before the leading intellects in such subjects, or endeavour to argue with and persuade them to my views, without knowing correctly the elements of the subject. It was essential to obtain tables, statistics, and returns, and learn where in each place the best sources of information were readily to be found. Thus, on my arrival in each capital, I was able to have a file of official returns, books, and papers awaiting me. The first night, at least, was passed in abstracting the essential points—in fact, in “cramming” for an examination; and when I called on a minister or ambassador next day, I was able to pass without a break-down—in short, I was not “spun.” On leaving each capital I bequeathed to my landlord a holocaust of such papers, which neither he nor the incoming tenant of the wondrous litter of my room was likely to study for amusement.

Meanwhile, the Foreign Office was preparing its numerous circulars: and the time of my detention in London was occupied in consulting many who were able and willing to advise. In particular, I am greatly indebted to the kindness of Sir Wentworth Dilke, one of the Commissioners of 1862; Sir Francis R. Sandford, then also Secretary; Mr. P. Le Neve Foster, Secretary of the Society of Arts; Mr. R. Smith, of South Kensington Museum; Mr. Rapp, Consul General for Switzerland; the Marquis D’Azeglio, Ambassador from Italy; M. Van de Weyer, the Belgian Minister; Lord Rosse, Lord Granville, and Lord Clarendon. Despite their friendly assistance, it was clear they nearly all agreed in looking on me as only the leader of a forlorn hope.

It was the 21st of July, 1864, when I again found myself in Paris, ready to open the Exhibition campaign. The season was most unfortunate, for the heat of a very intense Summer had scattered the residents of towns; the officials, in particular, were reposing in the country, or gone to recruit at baths, while such as, perforce, remained behind, were not likely to be in the most conciliatory mood. This increased enormously the labour of correspondence, the arrangement of conferences, and the toil and time of accomplishing visits. Fortunately, Lord Cowley was still at his post. He spared no labour in writing to any of the leading French authorities whom I thought it useful to enlist in the cause. For his courtesy to myself personally, and his continued and earnest exertions our warmest thanks are due.

With the Minister of Commerce I arranged finally for the official publication and transmission of the prospectus throughout France. It was agreed that all the goods of exhibitors should be taken from and sent back to Havre, at the cost of the committee. I had also obtained power to promise that insurance would be effected against all sea risks, for the voyage to so remote an island as Ireland seemed filled with more than ordinary terrors. His Excellency pressed strongly for a guarantee from the committee against other accidents, and against loss by fire; but this I firmly declined, informing him that every precaution would be taken to guard against accidents, but that the committee could not hold itself responsible if any such occurred. I urged on him the reduction of the tariff for transport of goods through France to Havre, but he said he could only recommend it strongly to the several companies. This was effected to a great extent, so that the cost of carriage to French exhibitors was extremely moderate. The Minister declined taking on himself the organization of a committee, but agreed to publish the names, when selected, officially in the *Moniteur*.

The question of a committee was, indeed, the most important point. Let any one person drop suddenly into cities like London and Paris, with assemblages of men intent on varied and absorbing business; let him try to impress on them any new idea; let him gain the approval of many of the leading intellects, the sanction of the Government, and the adhesion of individuals; let him then move on to other scenes, and reflect what permanent effect he can hope to have made. He may give an impulse, but there must be some continuous motive power to prolong the effect till it attain a practical end. My intention had been to enlist a certain number of influential men, as a centre of organization, to place at their head some illustrious name, and give them the assistance of an intelligent agent, employed at our expense. Such a body would understand fully local questions, names, and merits; and the Executive Committee would only deal with the local committee, not with the individual exhibitors.

As regarded the industrial department, I prepared such a list and obtained many adhesions, but I felt that all waited for some influential example before committing themselves finally. I therefore saw Prince Napoleon, who discussed the programme ably in every detail, approved as sufficient the facilities offered by the committee, and seemed inclined to allow his name to be placed as “President d’Honneur” of the French department. He, however, deferred his final decision till he should hear from me that arrangements were more advanced. The only apprehension he now felt was lest the approach of the Exhibition at Paris in 1867—intended to eclipse all previous displays—should overshadow our humbler effort, and absorb all French interest. He recommended me to seek an audience of the Emperor—advice which I afterwards deeply regretted I was unable to follow, I learned from the Duc de Bassano that the Emperor’s stay at Vichy would cause considerable delay; and the necessity for rapidity

in my movements discouraged me from the attempt. A few words from the all-powerful head of the nation would have marvellously quickened subsequent arrangements, and swept away the red tape delays of officials.

As to the Fine Arts, the Surintendant des Beaux Arts, Le Comte de Nieuwerkerke, thought a separate committee necessary. This would lighten the labour of each, and prevent the difficulty of manufacturers and artists coming into collision in the decisions on their distinct departments. This committee the Count thought he could organize, with the assistance of Mons. de Courmont, Directeur des Beaux Arts, and consented to act as President d'Honneur, and to name an employé as secretary.

I therefore fancied I had put in train the most complete machinery, after a great amount of detail, visits, and correspondence. It only remained to find an agent to represent the committee. I arranged with Mons. Cappe to accept this office, and felt delighted at leaving the scheme to be worked by a man of such excellent reputation and business capacity. At the last moment, however, when I had written to make appointments in Brussels, and was on the eve of starting, he thought it necessary to resign. He found that the enterprise seemed to be assuming larger proportions than he had anticipated, and feared that he could not conscientiously undertake it, consistently with his other duties. Thus, at extreme inconvenience, I had to remain two days longer in search of another agent. The search was nearly as difficult as that of Diogenes for an honest man; and, as the sun blazed down with almost tropical force I longed, unlike the philosopher, for some one to stand between me and its beams. I finally forwarded to the committee several names strongly recommended to me, from which they selected two—Mons. Savoye and Mons. Tolhausen.

The difficulty of an office had also engaged me. House-hunting at home is disheartening, but this seemed wholly impracticable. As an instance, I may mention being offered, as a special favour, space for barely a chair and a small table in an office on the Boulevards, shared by about six others, each carrying on a distinct business, for the modest figure of £200. Finally, we did better, for the government assigned us a most convenient room in the Palais de l'Industrie, Champs Elysées. I did not leave without seeing most of the representatives of foreign powers resident in Paris, so as to obtain considerable information and facilities. With respect to Spain, as to which no previous enquiries had been made, having had the pleasure of meeting Lord Howden and Lord Clarendon at dinner at Lord Cowley's, I learned much which led to the conclusion that the moment was eminently unfavourable, and the time too short for succeeding there in the industrial department. The committee accordingly abandoned the attempt; but Mr. Mulvany, Director of the National Gallery in Dublin, visited Madrid, and succeeded in obtaining one of the richest collections of pictures of that School that has ever been seen in Great Britain.

Besides those which I have referred to on my previous visit, I received great courtesy and assistance from Le Chevalier Schwartz, Mons. de Courmont, M. Ozenne, Directeur du Commerce Extérieur; Mons. Julien, Ministre du Commerce Intérieur; Mons. Davillière, President de la Chambre du Commerce; Mons. C. de Franqueville, Auditeur du Conseil d'Etat; and cannot sufficiently thank both Mons. Le Play and Mons. Trescat.

Again, at the close of October, 1864, I returned to Paris, after having visited most of the Continental States. Even under the difficulties of constant travelling, I had endeavoured to keep up a correspondence with so important a centre. It was, however, impossible, at a distance, to succeed in stimulating with effect, and I could only feel that no motive power was at work, and that matters were hopelessly stagnating! It was therefore with intense delight that I saw my friend Mr. P. C. Owen enter my room the night of my arrival at Meurice's. This was, indeed, a welcome reinforcement, and came like the reserves in a battle to soldiers worn out by a long engagement! He was about to devote a few weeks to the same cause, and to visit many of the places where I had been, so as to keep up the stimulus. The next morning we called on Prince Napoleon. He had ascertained that he could not take an official position in the matter. If he did, it would involve a *projet de loi*, and the government would then have to give more than encouragement, and must undertake a heavy expense. He took charge of my written application to the Emperor, requesting his Majesty to contribute pictures, as well as specimens from the Gobelins and Sèvres. This matter subsequently entailed a considerable correspondence with the Maréchal Vaillant, and but for the kind and active offices of the Prince and Lord Cowley, there would have been no prospect of success, nor was it till March, 1865, that the Emperor consented to send from the Gobelins and Sèvres, while refusing to lend pictures.

We found the Industrial Committee had gradually become a myth, and that we must be satisfied with applications through our agents to exhibitors. Mons. de Courmont, however, still hoped to organize an Artists' Committee, but at that season all were out of town. I afterwards found this hope disappear like the other, but not, like it, without seriously affecting the result. It must be admitted that the exhibition of fine arts from France was a complete failure. All other nations and schools were more than adequately represented; France not at all, or only

by a few paintings, lent from private collections at home. In fact, the best specimens could not have been contributed by French artists themselves; those of first-class merit are bespoke beforehand for purchasers, and the government influence is exerted to place all novelties in their annual Exhibition, from which they could not have been transferred in time to Dublin. Had the Emperor, indeed, set the example, it might have been possible to have borrowed from private galleries. Without such aid the time was too brief.

Having visited some of the most eminent contributors of 1862, Mr. Owen then proceeded on his tour through Belgium and Germany, whilst I returned to Dublin.

The correspondence continued for some months to be carried on actively with the agents, committees, and exhibitors abroad; many enquiries were made, but few actual applications for space were received. Each nation seemed waiting to learn what the rest were doing. In the month of December, at an evening meeting of the Society of Arts, Sir Robert Kane read an able paper on Irish industries and the Dublin Exhibition. I was incidentally called on to explain what had been done abroad, and showed that a solid foundation had been laid for expecting ample foreign contributions. The activity of the London Committee, and the growing interest in England soon produced its effect abroad; and throughout the months of January and February, 1865, there seemed to be a sudden rush of foreign applicants, more likely to embarrass us from excess than deficiency. The agents and committees became urgent to know what spaces could be allotted, that they might know how to select. There were so many other pressing matters to absorb the Executive Committee and officials, that I was requested to undertake this task. It was a formidable undertaking for a mere amateur, but I trusted to zeal supplying the defects of inexperience.

The lists of applicants were apparently enormous. The amount asked would have filled the entire building. The general principles of selection had to be considered and laid down; the claims of the different countries balanced, and as near an approximation as possible made to what they would adequately fill, then dividing the entire foreign space in the resulting proportions. In the main, these proved not very incorrect, but frequently those which asked most, when the time came to send over, had most defaulters. After dividing the aggregate space of each country, and sending over maps and drawings, audacious telegrams would upset my equanimity, some refusing to appear if they did not by return of telegram get an impossible addition of some 5,000 square feet! Where there were local committees, or government commissioners, I did not interfere with the details; they were left to subdivide their own territory as they thought best, retaining the passages marked on their maps. I made suggestions and wrote observations upon the various items of these lists, but left the decision wholly to them. However, in the case of France I thought it necessary to settle the exhibitors and allocate the space wholly from the committee here.

Those who don't know what the "allocation of space" is have never had their ingenuity and patience taxed to the uttermost. It is an elaborate Chinese puzzle, combined with the effort to please everybody. You allot to each a certain number of square feet, proportioned to his demand, his merit, and the articles he offers. He accepts them grudgingly, or refuses indignantly. In the latter case, you either lose him wholly or enter on a fresh correspondence. If you alter your map for him, you injure his neighbour, who thus has the luxury of a real grievance. If he accepts the space he is entered on the map, and a tracing of his allotment is transmitted to him. Then begins a greater difficulty. You give him an oblong, but he wants a square; give a square, he wants a round; or, finally he is sure to have a case that can only stand in a peculiar way, and cannot tolerate its neighbours. At length my Chinese puzzle began to fit into its place, but still there were many undecided or discontented, and all were sending letters. Once more, then, I must cut short correspondence by a personal visit, and once more, on the 6th of March, 1865, I set up a kind of bureau at Meurice's Hotel. Even there, it required eight days of hard work and endless interviews, aided, part of the time, by my friend Mr. Owen, to reduce chaos into order, and obtain the assent of all to my map. Exhibitors saw that they could not expect actual impossibilities, and finding that my only object was to do what was fair and right, pardoned inevitable defects, and cheerfully addressed themselves to making preparations.

We again saw Prince Napoleon, who promised to visit the Exhibition, and conveyed to us the Emperor's consent to contribute from the Imperial manufactories. I therefore waited on the *Maréchal Vaillant*, as *Ministre de la Maison de l'Empereur*. He explained the reason why his Majesty could not send pictures, and doubted if any fine arts would be contributed from France. He was correct in his conclusion, but not, I think, for the reason he bluntly assigned, that there were no French artists! He gave me the necessary authorization to the heads of the manufactories. Proceeding to the Gobelins, I was met with great courtesy and readiness on the part of *Mons. Badin*. There were but very few pieces available; but he offered two excellent ones, and I prevailed on him to add a third, the beautiful copy of Raphael's "*Vierge au*

Poisson;" I then saw Mons. Regnault, the celebrated chemist, who is the Superintendent at Sèvres. There was naturally greater difficulty in arranging for the carriage and care of objects so frail and valuable as the beautiful porcelain ware, but they were only of that class of difficulties which are "things to be overcome." That they were overcome will be acknowledged by all who saw the collection he sent over, splendid alike in detail and in tasteful arrangement. The sudden death of the Duc de Morny occurring at the time was an additional obstacle to arranging with persons in official position, and it was no small loss that it also postponed a state dinner at the Embassy, where I should have had an opportunity of mentioning the Exhibition to the various foreign representatives.

Amongst the applications from France, the space asked for the exhibition of wines was naturally very large. From Germany, Austria, and Italy a similar difficulty arose. It had always appeared to me useless to exhibit a range of bottles on shelves, whose merits there was no means of testing. The product is, of course, one of the most important from those countries, and is also one in which there is most for the public here to learn. It occurred to me here, for the first time, to effect this by having a sufficient supply sent over to allow of its being sold as specimens. I found the French wine-growers delighted at the idea, and on my return framed a circular proposing an arrangement for the purpose. A cellar in the building was allocated to each country, under the charge of the customs officers. The contractor for the refreshment rooms was bound to sell Exhibition wines at the prices marked, adding 6d. for commission on each bottle, and printed lists were placed in the refreshment rooms. Had this idea been developed earlier, it would have been a most interesting and novel feature; but late as it was, it introduced many new wines likely to create a commerce, and imparted the rather unusual knowledge both of what they were as delivered by the producer, and what was their cost upon the spot.

It must be allowed that the French department did not completely represent the varied branches of industry of that great nation; but it is equally true that all for which France is most remarkable was sent, and always of the highest merit. Indeed, in our space it could not be expected that more than the characteristics of each State should be given; an epitome, rather than an exhaustive display, of its entire range of capacity. The silks, dresses, laces, tissues, *des meubles*, beautiful bronzes, pendules, and fine iron castings, were all magnificent. Those who were first in each line contributed, while the multitude held back to prepare for the coming competition of 1867. Amongst the exhibitors it is only just to mention how much is due to Mons. Corbière, who afterwards received the decoration of the Legion of Honour for his services; and to Messrs. Ferguson. Both were the chief means of persuading many of the best to exhibit, at a moment when they held back, waiting for influential examples.

**BELGIUM.**—On reaching Brussels, at the close of July, I found that Mr. Sanders by his visit during the previous month had prepared and smoothed the way. My first consultation was with Mons. Fortamps who had been president of the Belgian Commission in 1862. He had already ascertained the feelings of his Government and of the public, and had considered our difficulties and prospects; thus I found, when I had modified our arrangements so as to meet his views, I had practically removed the objections of all others. He enabled me at a single blow to decapitate Belgian opposition. Of course the same objections were made I had so often listened to, but I was now becoming callous; I had also the influential example of France to point to; and Mons. Fortamps spoke as one who sought not to discourage, but to aid in overcoming obstacles.

I was prepared, from previous travelling, to find Ireland scarcely admitted into the family of European nations. If England be called "insular," we are almost Transatlantic. The old Roman phrase, "*extra orbem terrarum*" has not yet lost its meaning. We are still the "*ultima Thule*." As I proceeded more into the heart of Europe this idea became more exaggerated, and I was surprised at the wild views announced as to our geography by men who were supposed to be well educated.

The danger and length of the sea voyage was one subject of alarm. This was partially met by our insuring against sea risks. But how was it possible to hold an Exhibition in a country whose population habitually died of famine, and whence the wretched survivors only saved themselves by flight across the Atlantic? We were also supposed to live in a normal state of terrorism, rebellion, and oppression. The tumult which took place at Belfast confirmed this idea; and I should have been left without a convincing reply if I had not been able to point to the far more serious *émeutes* I met at Geneva, and afterwards at Turin. However, I was not pressed by such alarming pictures in Brussels, but by the rational argument that we were far removed from the European centres of commercial activity, and that we did not possess that importance in ourselves that could, as in London, compensate for our remoteness; while our country did not offer the prospect of opening new channels of commerce, or even of supplying wealthy purchasers for the choice goods of exhibitors.

Here, as elsewhere, I could explain that Dublin, on such an occasion, would be visited by hosts of English tourists, and that every American traveller to Europe would land at Irish ports and visit the Exhibition, no matter what his destination; while I was not sorry to have the opportunity of explaining to many, whose opinions are amongst the most influential abroad, truer and more hopeful views of our nation's prospects and progress. Another mistake was very general, and created a serious prejudice against us. The Royal Dublin Society had held, under its auspices, a series of exhibitions which were eminently useful and successful, as long as they had a definite purpose. One was projected for 1864, which professed to be for "Irish industry." There could be no more worthy or legitimate object; unfortunately the name was retained, but the purpose practically departed from. Into the cases of native exhibitors were introduced goods imported from all parts of the world. It failed wholly in the interest of illustrating what our country could accomplish, and degenerated into a purposeless bazaar. With the intention of attracting the paying public, efforts were made to collect paintings and works of art from abroad; circulars were sent to every foreign country, and applications made to the different public bodies. It was soon discovered there, that this non-descript attempt was not successful. It was supposed that my application was a continuation of this, and the confusion naturally created a strong prejudice against us. It was only a misunderstanding requiring explanation; but what difficulties in life, between individuals or nations, are not misunderstandings, if they were only traced to their source? It created an unfavourable prejudice, and prejudices, though they may be disproved by reasoning, cannot readily be annihilated.

I found that the Ambassador, Lord Howard de Walden, was absent; but the interests of the Exhibition in no way suffered; for the Secretary, Mr. H. T. Barron, an Irishman too, entered into the matter with the greatest zeal, exerted himself to aid me in every way while there, and afterwards spared no labour to insure success. I may add, that his complete and varied acquaintance with every detail of the industry and resources of Belgium made it very easy for me to master, under his guidance, the information necessary for myself. I found a third gentleman, no less zealous and intelligent, Mons. Corr Vander Maeren, whose influence, knowledge, and kindness were invaluable.

Guided by their views it only remained to settle officially with the Government. I therefore called on Mons. Vandenpeerboom, Ministre de l'Intérieur, and Mons. Bellefroid, Directeur de l'Industrie. It was agreed that the Ministry should give its sanction and earnest recommendation to the enterprise—that it should reduce, to at least half, the cost of carriage of goods on the railways throughout Belgium, which were mainly in the hands of the Government—that it should publish officially, in French, a copy of the prospectus—that it should announce the Committee, when formed, under the presidency of Mons. Fortamps—that the port of embarkation should be Antwerp, and that the goods of exhibitors should be taken thence and returned, if unsold, at the cost of the Executive Committee, and should be insured against sea risks—that there should be agents to look after the unpacking and repacking of goods in Dublin, and that the Government should not be called on to defray any such expenses. Mons. Dulieu, who had acted as secretary to the Commission in 1862, again offered his valuable services; and feeling that the further working out of the plan so organized could safely be left to the three gentlemen named above, I bade adieu to Belgium with confidence in the result.

The general election took place shortly afterwards, and was accompanied with nearly as much excitement as if fought on British ground. For a time politics absorbed all other interests, and the tumult of party strife left no opening for even the most zealous to push the cause of a distant Exhibition. Later in the year Mr. Francis W. Brady, one of the Executive Committee, was able to visit Belgium, and reanimate our friends to work. The result was a display of everything that is made in that country; and what is not made there? Perhaps no space in the world is, for its extent, so independent of the rest. Containing coal and mineral treasures, it has also artisans skilled in every manufacture. Thus, its collection was an epitome of all the requisites of life. Much was not attractive to the mere sight-seer, but indicated to the thoughtful the strength of the nation's resources. Amongst its contributions were two organs of excellent make, being the first occasion of such instruments having been exhibited from abroad.

The Belgian artists offered pictures in great numbers; the list sent over afterwards amounted to more than 400, of which we were able to find space for about 140. These were placed in a separate gallery, and though not of that excellence which has of late raised so high the reputation of the Belgian School, there were several worthy of its fame. Baron Van de Weyer had, in London, led me to hope that the King would contribute from his collection, and exerted himself to obtain so important a concession; but, unfortunately, three of those lent by his Majesty to a former Exhibition had been returned damaged, and the application was unsuccessful.

HOLLAND.—The journey from Brussels to the Hague is not performed continuously by railway. At Moerdijk it is necessary to get into a small steamer as far as Rotterdam. Now this was pleasant enough for me as a traveller, gliding along in the midst of quaint villages,

windmills, and ships of antique fashion; but it occurred to me forcibly that it would make a serious difficulty in the transport of goods if Antwerp were to be the port of embarkation. Such, indeed, proved to be the decided opinion of the Dutch authorities; and it was accordingly arranged that the exhibition steamers should take goods from Rotterdam as well as Antwerp. This had the further advantage of accommodating such exhibitors as sent from Germany down the Rhine.

On the 2nd of August I found myself at the Hague. It is the official seat of Dutch administration, though itself possessed of little commercial activity. I presented my introductions to our Minister there, Sir John R. Milbanke, but merely in discharge of a necessary formality. Fortunately for me the Dutch Ministry were accessible and enlightened, ready to enter attentively into any business of public importance. Here, indeed, as elsewhere, it may be remarked once for all, I was at first received with a politely incredulous smile, as an enthusiast urging his impracticable chimera. As explanations were given and details discussed, this disappeared, and I seldom failed to convince the listener that our success was both feasible and probable. With the example of France and Belgium now to cite—an argument, gathering force with each country I gained, like the cumulative verses in the *House that Jack Built*—the ministry readily gave their adhesion, on the same terms as the Belgians, but making Rotterdam the port of embarkation. They also promised to publish officially, in addition to the French translation, a version of our prospectus in Dutch—a task which was necessarily left by me to them to perform! Having called on Dr. Stüring and the Baron Van Hagenlanden, I then proceeded to Amsterdam, the real centre of commercial energy. Here I called on the Burgomaster, and Mons. C. E. Vaillant, “Secretaris der Stadt,” the latter gentleman entering warmly into the subject, and undertaking the formation of a committee. He somewhat startled me, however, by the information that a very splendid building was in progress in Amsterdam, and that an Exhibition would shortly be opened there. I at once went to Mons. Van Eijk, who was at its head, and who had also been a leading man in 1862. He reassured me by stating that the exhibition would be local, and not international; that there would be no opposition, and that he would aid us in every way as soon as his present task should leave him any leisure. This building is very fine, costing, I believe some £120,000, the greater portion of which, as is usual in Amsterdam, is sunk beneath the level of the surface. After my departure these gentlemen continued to organize the means of making the Dutch department worthy of their nation. They were fortunate enough to secure the assistance of Mons. C. Boissevain as Hon. Secretary and Representative, and no department in the Exhibition was more completely carried out or better managed. Unfortunately, at the time of the division of space their demands were so much below those of others that they scarcely received their due share; for it proved that, while there were many defaulters, at the last moment, from other countries, the Dutch promises were fully and faithfully carried out. Their products, as might be expected, were rather of the useful than ornamental kind, but these were not wanting. In several substances classed as food, particularly liqueurs and tobacco, they were probably the first. Some of the Dutch paintings were of a very high class, and had moderate prices affixed; but, in the competition with so many specimens of more brilliant schools they hardly secured their fair share of attention.

ZOLLVEREIN.—Bidding adieu to the facile French, I now committed myself to terribly bad German. Hence I learnt how great an art in conversation it is to listen well, being invariably pronounced most agreeable when I had said least.

Pushing on to Düsseldorf, I found there some of my countrymen ready and able to assist. Mr. Mulvany had long been resident, and had an hereditary claim to be well acquainted with matters of Art. Mr. Perrott was well known, and willing to exert his influence. When I found an Irishman abroad I felt entitled to put him to hard work. I saw an admirable collection of modern paintings at the gallery of Herr Shulte, who thought the artists would readily contribute on the terms offered. In fact, when I saw the specimens of that unrivalled school of landscape painting, I felt we could safely offer to pay all expenses necessary for their exhibition.

There is in Düsseldorf a society of artists for the express purpose of arranging such matters. I saw the Secretary, Herr Schlesinger, who assured me they would contribute, and would themselves select such works as would do them honour, provided they were not controlled or rather hampered by any paid agent. The result proved most fortunate; who that saw can forget their splendid collection of paintings, varied by the nationalities and individualities of the artists, but all bearing the impress of the school? The celebrated Achenbach hoped to be able to send, but his pictures are always bespoke, and he receives in Germany prices quite as high as he can get in England. Professor Tiedeman afterwards undertook the collection of paintings from Scandinavian artists studying there, and formed a most admirable gallery.

I saw Herr Baum, or more correctly, “Herr König! Commerzienrath Handelsgericht Präsident Baum,” who promised to look after industrial products. Düsseldorf has these in abundance, but its interest for us lay in its charming pictures. Here too resided the gentleman

who afterwards took on himself the labour of the entire Zollverein department in Dublin; and no more zealous, conscientious, or popular representative could have been found than Herr Von Sybel.

After passing through Cologne, and explaining the project to the Consul, Mr. Newnham, and sowing a crop of German prospectuses where they might be likely to produce useful fruit, I reached Frankfort late on the 7th of August. Fairly worn out by having been broiled in Paris, dusted in Holland, and "palavered" everywhere, I went to bed; and getting up, as I thought to breakfast, went down to find myself at the 5 p.m. table d'hôte. Even a Member of an Executive Committee is mortal, and mortality claims occasional repose.

At the legation I received every courtesy and information. The chargé d'affaires explained with official distinctness the peculiar difficulties of dealing with the German Governments. Hitherto I had always found some recognized head or minister with whom to discuss the arrangements for an entire country. In Germany there are some twenty-seven minor States which, despite their unity as to commercial taxation, have no common authority to whom to address official communications. Though it is not probable they would conflict in such arrangements, it is necessary to deal with them separately, and experience the further delay of their discussion amongst themselves. Indeed the British representative at Frankfort is only accredited to three States; and Frankfort itself, having the dignity of being an independent republic, claims the compliment of having a British Consul for itself, Mons. Koch. This political constitution did not at all suit an International Exhibition which had only a few months before it for organization. The experience and influence of Baron Bernus were kindly exerted to aid us in our difficulty. Having taken the leading part in 1862, and being one of the chief members of the "Haut Sénat," there could be no better authority. His views agreed with the practical experience of Herr Peter Bender, who had acted as agent in nearly all the previous Exhibitions, and whose most valuable services we were fortunate enough to secure for this. I also consulted the committee of a local exhibition then open in Frankfort, especially Herren Glogan and Kucken. This building is a permanent one, and its contents were very attractive; but, like most professing to be local, it was only so in name, and I at once recognized the products of every quarter of Germany. This more strongly confirmed our conclusion that Frankfort would make an important centre whence to issue prospectuses, and in which might be collected specimens from other states of splendid glass, china, and works of ornamental art. I therefore drafted circulars to be sent by the committee to the various German States, confided to Baron Bernus the task of organizing a local committee, and to Herr Bender that of acting as secretary and representative. His task was difficult, for the length of carriage to Antwerp and Rotterdam was enough to deter exhibitors; but it was necessary at any cost that so important a department should not be left unrepresented, and this object was sufficiently accomplished. In an exhibition limited in extent it is necessary to omit no important nation, but it is not requisite to have, what in a museum are termed, duplicate specimens.

Leaving Frankfort in the middle of August, I lost sight of the Zollverein for some time, during which I visited Switzerland, traversed the entire of Italy, and then proceeded to Vienna, returning by Munich, which I reached the 18th of October, 1864. Not having felt certain of being able to reach this, I was unprovided with a letter of introduction to our Embassy, but thought it my duty to call officially. My reception made me feel how indispensable had been my precaution in all other cases, and how much success was naturally due to the knowledge that the passing representative of the Exhibition was disinterested and faithful. Happily a letter from Mr. F. Burton, the celebrated artist, to the well-known Mr. Harold Stanley, accomplished all that was requisite. Bavaria is artistic, even in its industry (excepting its beer, which is very matter-of-fact), and none better than Mr. Stanley could secure the co-operation of artists. The pictures, painting on China, stained windows, glass, designs for mural decoration, and above all the noble cartoons in which men like Kaulbach and Hesse embody their glorious designs previous to execution, these formed a most attractive prize well worth winning for Dublin. The cartoons were of special interest. Generally representing frescos and other works that cannot be transported, they are even more instructive to the student of drawing than the works themselves completed in colours; and yet they had never been seen in any international exhibition. Mr. Stanley offered to procure many of the best, and Mr. Mulvany aided me in urging their acceptance. A serious difficulty lay in their great size, and it was also doubted by many whether the general public would feel any interest in these noble but severe studies. Happily the height of the large music hall in our building afforded a most suitable room to hang, above the smaller works, these vast surfaces, whose effects demanded space and distance. Thus seen, nothing was more universally appreciated. Connoisseurs differ from the public in criticising minor beauties or in discovering the merits or defects of second class works; but all, both learned and unlearned, unite in paying homage to the highest order of talent. They only differ in the manner; the few analyse and reason—the many feel and admire.

The question of transport was solved by having these gigantic sheets of paper carefully rolled up in long boxes, and thus readily conveyed to Dublin, of course at the cost of the committee. The management of this and of Munich art, I left confidently in Mr. Stanley's willing and able hands.

Finding that it would be hopeless for me to attempt a visit to Northern Germany I advised the Executive Committee to make arrangements for sending some other representative to Berlin and Dresden.

AUSTRIA.—Venice was reached early in October, 1864, at the close of my Italian tour, and before visiting Vienna. Flushed with successes, achieved or promised elsewhere, I stepped into my gondola with self-complacent confidence. Letters and friends I had in abundance, and personally I was more than warmly welcomed. I bore about me, as it were, the atmosphere, language, and feelings of Italy, and that insured my cordial reception. Yet here a few minutes conversation discouraged me hopelessly. I was accustomed to be told of impossibilities, and to see them surmounted. But former difficulties had been matters of reasoning; here I was checked by the impassable barrier of deep resistless feeling. Love and hatred cannot be overcome by logic or argument.

The Government at Vienna had sent a circular to the Chamber of Commerce, condescendingly granting the Venetians permission to contribute what they pleased to the Austrian department, but giving no encouragement, and offering no assistance. That which made the despatch irritating, as well as useless, was the enclosure of one of our prospectuses in the German language. Now, the first eager question put to me was, could they contribute to the Italian department? This was plainly impossible. Then nothing could induce any one exhibitor to send an article to add to the splendour of the Government which they called both foreign and detested. I saw numbers of the most influential inhabitants, and with all found the same determined feeling. They were anxious not to be the only part of the peninsula omitted; but they would not consent to voluntarily sever themselves from Italy, even in an exhibition. I suggested the middle course, of having a separate Venetian court, which would have met this feeling; but I found it would have given offence to the court at Vienna, precisely for the reason that it pleased Venice; and it was abandoned as impracticable. Mr. Mulvany was at Venice at the same time, and arrived at the same clear conclusion. So we had to leave, with regret, their glowing paintings, their jewellery, glass, and mosaics. It was hopeless to remain, and bidding adieu to the last vestiges of a southern sun I plunged into the Wintry Alps, and passing over the wondrous Schneringer, reached Vienna on the 15th of October.

In Paris I had learned much from the Chevalier Schwartz, Consul-general for Austria, and having also written from Italy to our Ambassador, Lord Bloomfield, I was immediately, on arrival, put in possession of the means of action. Mons. Schwartz had been consulted by the Cabinet as to the possibility of holding an International Exhibition at Vienna in 1865, but had advised the Government strongly against the attempt at present. Had it proceeded it would, of course, have precluded any hopes of assistance to us. It was, therefore, important to learn from Lord Bloomfield that it was postponed, not exactly *sine die*, but to 1872, or some date equally indefinite.

The Government had already printed our prospectus in their Official Gazette. Thus it was certainly recognized; but it was also skilfully "damned by faint praise." It was not sufficient for our purposes to be simply tolerated. Here Government is not only absolute, but is the mainspring of action, without which individual enterprise either is not attempted or fails. If it were in earnest we should need no organization of our own for Austria, as the Government would take all action on itself by naming a Commission and giving specific instructions to the local societies of art and chambers of commerce throughout the empire. The great obstacle to such steps lay in the complete exhaustion of the treasury; in fact this was an objection made by the minister of every country to me, and it was extraordinary what relief my assurance gave that we wanted aid only in encouragement—not in funds! The difficulty here was to devise how, without deviating from the system of the country, one could be given without the other.

In solving these difficulties Lord Bloomfield gave me every aid that knowledge, kindness, and a warm interest in the subject could suggest, and brought me in friendly contact with those best able to assist. Baron Rothschild pointed out the cost of transport either through France or by the Rhine, as had been intended. He thought it hopeless to ask exhibitors to go to such heavy expenses, especially as they were greatly dissatisfied with the results of 1862. He suggested the route to Hamburg, and thought, as he was a principal proprietor of the northern line, he could promise a reduction to half fares. Thus, if the Executive Committee would take the goods from and back to Hamburg or Bremen—for the former port might be frozen up in March—the terrors of distance and expense would be sufficiently diminished. Mons. Le Chevalier de Parmentier, of the "Handelsministerium," furnished me with precise details of the cost of carriage of goods, and the information thus obtained decided the Committee to adopt their suggestion. The Minister of

Commerce, Baron Kalchberg, on hearing my explanations, and learning the facilities proposed to be given to exhibitors, without drawing on the Government purse, abandoned his unfavourable prejudices and consented to adopt the project; still he did not see how the State could name committees, or do more than send our prospectuses everywhere with strong official recommendation. This he promised to do, and this he did. Baron Lewinckay, "Kultus Minister," adopted the same views more readily and warmly, and undertook to communicate with the heads of galleries and art institutions, the control of which rests with his department. He recommended me to ask for a commission with the names of the Ministry at its head. I therefore had an audience of the Prime Minister, Baron Schmerling, who was not averse to this step—if it would not commit the Government too far. Hearing the list of nations that had already promised to assist, he appeared quite alive to the importance of not leaving Austria unrepresented. A few years had enabled it to advance rapidly in the path of industrial and commercial progress; this he wished to prove at our Exhibition; still the option must remain with the exhibitors, while he would take the steps I suggested, to prevail on and encourage them. Transport by Hamburg would be absolutely essential.

It only remained to ascertain whether the industrials would yield to this persuasion. At present I could not enter on a labour involving so much detail, which I had to leave for a future visit of Mr. Owen; but the President of the Chamber of Commerce, Herr Klein, effected more than all our arguments by setting the example as a contributor, and thus exerting the influence of his position in the most practical manner; indeed his case of ornamental leather work was one of the most popular at the Exhibition. Many of the other articles were highly important, but this branch of industry, quite a *spécialité*, was most attractive. In the rest of the Austrian Department the thick woollens, cheap and "wunder-warm," the coarse textile fabrics, peculiar pottery work, and the unpretending matches—of which the manufacture is enormous—its Hungarian wines and liqueurs, all made, it is true, a slight display, but were, commercially, of the highest importance. The cheapness and simple beauty of the clocks soon claimed attention, and has probably given them a permanent place in our commerce.

The proposed committee at Vienna was afterwards abandoned, and its place supplied by the experienced services of Herr Heinrich.

SWITZERLAND.—Unhappily there is little of official interest to report from here. The Consul-general in London, Mr. Rapp, had not led me to be sanguine; every additional piece of information only confirmed his views; still no country should be resigned without a struggle. Reaching Lucerne, the 12th of August, I found my energies had been overtaxed, and that I had no choice but to pause and recruit—"reculer pour mieux sauter." Scorched in the plains, and stewed in the cities, I determined to put myself in ice amongst the glaciers for a few days. Thus, it was late on the 17th when I descended from the Oberland Alps to Berne—and business. It was not easy to collect my scattered ideas—still less my rambling luggage. My bag was at Grindelwald, my portmanteau *en route* for Italy, my keys at Lauterbrunnen, and my hat-case remained as the sole relic of respectability. Luckily, for my character with the waiters, there was a huge pile of letters with flaring seals and coats of arms, and packages of papers and prospectuses, sufficient, in volume, to represent a more than abundant wardrobe; still, as I could not actually dress myself in my correspondence, like an advertising medium, this did not materially affect my external decoration.

The British Minister, Admiral the Hon. E. Harris, was most anxious to aid the Exhibition as far as possible, but evidently did not think the probability was very extended. He, however, referred me to those who could more certainly ascertain the wishes of the Federation. Le Conseiller Fédéral Schenk acts as Minister of the Interior; he is the central official to communicate from externs to the several governments of the twenty-one cantons. He willingly agreed to forward our prospectuses, in French and German—two-thirds of the cantons being the latter—with a statement of what had been accomplished elsewhere, and the strongest recommendation he could give. It would then be optional with the local government of each canton to take the further steps and urge on their respective chambers of commerce. He also published an announcement in the two official papers, the *Feuille Fédérale* and the *Schweizerisches Bundes-blatt*. Professor Vogt had already acted in 1862, and agreed now to become our representative for 1865. He did not see any possibility of obtaining fine arts. Switzerland possesses artists, but they rarely remain at home, and go elsewhere to seek wealthier markets for their talent. Machinery was equally out of the question; but there was no reason why exhibitors should not be found of the jewellery and clock-work, the elegantly carved woods, silks, cottons, and straw-work—not forgetting the cigars and tobacco which, if not first-rate, every traveller has found at least agreeable. The project of a committee seemed hopeless. There were no residents at Berne of sufficient weight to command the confidence of all the cantons; and if members were selected in each of the twenty-one localities they would be too scattered to act together, and the machinery too cumbrous. It was, therefore, finally arranged to leave Professor Vogt to accomplish what he

could singly, that, at least, Switzerland might not be the only blank in our catalogue of nationalities. Meanwhile correspondence had so accumulated both with those whom I had left behind, and who required frequent stimulating, and with those who were before me, and who required preparation, that I made the Bernerhof my *bureau* for three days, and laboured some seven hours per day as my own secretary. I had intended to pass through Geneva, but when actually on the lake I heard of the serious *émeute* there, which threw the population into excitement and confusion, and would have made my peaceful mission utterly unavailing. I therefore turned aside and crossed the Alps by the St. Bernard Pass.

KINGDOM OF ITALY.—From St. Bernard to Ivrea I walked and drove incessantly from 4 a.m. to 11 p.m., making Turin the next morning, the 27th of August. My hot haste—and it was very hot—availed me little at first. My portmanteau, having concluded its tour, was lodged in the Dogana; and thence it cost me a day to dislodge it, signing a dozen registries, and as often seeing properly recorded for future historians the interesting fact that it weighed just 34 kilogrammes! As it contained my letters and credentials, without it I possessed no weapons of attack. The season made further delays. Everyone claiming to be civilized had fled from the scorching heat of the sun-king, and it required many notes, and sultry miles of dusty road, to accomplish visits that need not have occupied a couple of days at a more auspicious moment. The Marquis d'Azeglio, in London, had said truly, that the physical difficulty alone might baffle me. However, I was able to obtain sufficient advice and aid to work out the organisation that could only be set on foot in the then capital. Nothing could be more kind than my reception, or more intelligent and anxious than the inquiries and consultations about our project. So much so that it would hardly be possible here to thank individually those to whom our best thanks are due. The Ambassador, Hon. G. Elliott, and his Secretary, Hon. W. Jocelyn, opened the way earnestly and effectually. I had frequent interviews with the Minister of Commerce, Commendatore Manna, and his very active Secretary, Signor Serra; also with Count Menebréas, and Commendatore Bona, Minister and Secretary of Public Works, Signor Tasca, President of the Chamber of Commerce, and Signor Ferrero, who had exerted himself for it in 1862, Signor Amari, Minister of Public Instruction, and the Marquis Rorà, who occupied the position of *Sindac* at Turin—a sort of permanent Lord Mayoralty—and who was one of the few of the old aristocracy who took an active part in the new system of government. Nor should I omit Signor Achille Parigiani, whose time, labour, and local knowledge were placed patriotically altogether at my disposal. Signor G. P. Jervis, Curator of the National Industrial Museum, was, however, the gentleman whose experience in 1862, and whose zealous labours now finally enabled us to work out the details of a complicated organization. He became practically our representative; and, as Secretary of the Royal Commission, carried on extensive correspondence both with the Executive Committee in Dublin and with the local Committees throughout Italy. He it was who came to receive the goods before the opening, and to witness their departure at the close; and who mainly compiled the special catalogue of the Italian Department, which is rather an able series of descriptions and explanations than the mere usual list.

The details of these negotiations would be tedious. Letters and conferences were endless, for it is in vain to write to an Italian if you cannot also speak to him. Then every official required written statements and formal despatches in Italian, which kept my pen going nearly as fast as my tongue or my feet! But the results are brief, and are all that need here be told. The Ministry was earnestly anxious that Italy should occupy a brilliant position at the Exhibition. A young country, awakening to the possibility of developing its vast resources, with a deficient exchequer, which general prosperity alone could recruit—it was of the first importance to lose no opportunity of improving its industrial arts, or extending its commercial relations. As a matter of pride it was natural to wish to make a favourable demonstration, and prove to the world that their few years of newly acquired freedom had been also years of internal growth and progress. But here intervened the usual difficulty. How keep up an army of 400,000 men, and contribute handsomely to the cost of the Exhibition? It was my duty to urge the reduction of the army as the wise alternative; but however sound the advice I certainly did not expect it to be taken! As usual it only remained to accept all the assistance that could be given us without expense. However energetic and even enthusiastic this might be, when once the Government had come to a decision, it was yet limited and all but paralysed by the history of the past. The various Italian States had been so long under "paternal government" that their subjects had not yet learned that which is the habit of the English—to do things for themselves. Whatever the merits of that form of rule it necessarily restrains individual action, and by making the state the sole head of all great enterprises reduces the inhabitants to a state of tutelage; according to our ideas they become children rather than self-reliant men. Though rapidly acquiring more independent views the conception of not looking wholly to Government to carry out an important work was not yet abandoned. This dependence was especially strengthened by what had occurred in 1862. A Royal Commission had been issued for that International Exhibition, and carried out with the

greatest extravagance. The fault, probably, did not lie with the heads. All administration was too newly formed and inexperienced, as well as marred by the relics of habitual corruption, to be worked economically. Thus the outlay of expenses defrayed by the Government had risen to the formidable total of £42,720, a sum, probably, nearly equal to the value of the whole collection sent! To repeat this would have been folly, either for us or for the Ministry. To work with an economy within the limits of altered circumstances would involve sacrifices on the part of exhibitors, and would disgust those who looked for a harvest from various employments. There the Government had done all, paid the costs of organization, of packing, transport, insurance, arrangement, agency, and care in the building, counters, decoration, and all imaginable payments, under the comprehensive head of sundries, or *spese impreviste*. With such a precedent it was impossible to compete. It is indeed a hopeful sign of the growing vigour and energy of the nation that it was able to show so much self-reliance as the result demonstrated.

The Government undertook to announce the Exhibition officially, with the strongest recommendation, by circulars and publication; and to give its sanction to our committees, when formed, so as to inspire confidence in the management. This was subsequently carried out by issuing a Royal Commission, adopting the central committee at Turin, and no less than 21 local sub-committees in the provinces. In 1862 there had been no fewer than 59. It also promised to allow our prospectuses and correspondence to be circulated throughout Italy by post without charge, and to effect a reduction of half in the cost of railway transport. The Executive Committee were to defray the incidental expenses of the organization, such as printing and clerks; and to take the goods from more than one of the Italian ports. Genoa was the most convenient for Northern Italy, and Leghorn was essential for Tuscany; while the Minister of Marine promised, if no better arrangement could be made, to send a vessel of war from Naples to Leghorn. Subsequently it was settled that the same steamer should touch at the three ports, and so accommodate every part of the kingdom. The insurance against sea risks, the reception of the goods in the building, and the erection of counters and fittings in the rough, were all to be provided for by the Executive Committee. Still more favourable terms were made for sculpture and works of art, so that artists should incur but little expense or risk, and have the advantage of an official agency for effecting sales in the building.

It was further necessary to print Italian prospectuses, visit and persuade those who were disposed to act on the committee, see the official circulars despatched, and embody these arrangements in official form, paying due homage to the exigencies of red tape.

It was strange that I had failed to effect a meeting with the two gentlemen to whose aid I attached the highest importance. Sir James Hudson, so long the ambassador, possesses an experience, knowledge, and influence probably greater than that of anyone in the kingdom. The Commendatore G. Devincenzi had been long recognized as the foremost in promoting every patriotic enterprise for the progress of industry. To interest them would be to secure public attention; not to do so would be almost to fail in my mission. Letters and telegrams passed, and appointments were attempted; but destiny either made the letters miscarry or the appointments impossible, and I closed my tour in disappointment. Utterly perplexed while in Rome by the stoppage of all my communications from Turin, I returned that way in October, allowing myself a couple of hours to inquire at the Industrial Museum after my letters. There I found a gentleman who, struck by my inquiries, addressed me. It was Signor Devincenzi. He at once offered to place his time at my disposal for the day, as soon as he expressed his apologies to a friend then waiting for him. This friend was Sir James Hudson. Thus at the last moment fortune atoned for its delays; and I gladly accepted Sir James' cordial invitation, which afforded the advantage of enjoying conversation remarkable for its agreeability, and of receiving counsel and encouragement from those most able to give both.

Into Milan I was able to make a brief and fruitful incursion. Doubly armed with official authority and personal introductions I felt the advantage of my labours at Turin. I entered into full explanations with several who subsequently exerted themselves efficiently; the Commend. Curioni, Secretary of the Institute of Science; Signor Belinzocchi, President of the Chamber of Commerce; and Signor Pisani, its active Secretary; Signor Caimi, Secretary of the Brera gallery, and Signor Mongèri. All agreed in expecting small contribution from the industrials, but large from the sculptors, if not from the painters. I wrote a long letter of explanation, which the Chamber of Commerce printed for distribution, and visited several of the artists' studios. Amongst others I was fortunate enough to see Signor Magni, who had just completed a *pendant* to his famous "Reading Girl," a wonderful *tour de force* in marble, the now well known "Altalena" or "Swinging Girl." I trembled at the danger of transporting its delicate fabric, but happily the artist was able to see it in the Exhibition safe and admired. To this he added several others of his beautiful works, forming together a collection highly interesting and attractive.

After a second visit to Turin, to wind up lagging arrangements, I passed some hours in

Genoa and Leghorn, to ascertain all details as to steamers and transport. This business was finally entrusted to the well-known firm of Henderson and Co.

Florence came next; Florence as yet ignorant of the new crown about to be placed on her glories by the Convention of September. Not then the capital, it yet was the centre to which I most looked for art and artistic objects. A few days showed me that its sculptors could, unaided, furnish from the works ready in their *ateliers* sufficient of beautiful marbles to fill a gallery. Yet the event proved Milan the richer contributor. No doubt political events upset the minds of all at the new metropolis, and amid the excitement caused by the opening of the National Assembly, the sudden influx of officials and visitors, the expectation of wealth with those who had houses to let, the alarm amongst those who held a studio whose rent was sure to be doubled, and, finally, the Dante festival, there was little leisure to think of so distant a region as that of Ireland. However, the future was at that moment hidden from view, and we toiled on in the confidence of happy ignorance. Fortunately for both my pleasure and advantage my friend Charles Lever had then a villa near the Porta Romana. The world knows his brilliant talent and genial humour; his wide information and complete mastery of men and things is no less remarkable. To me his hospitality and ready aid were invaluable in animating and forwarding the objects of my mission. I found another countryman resident, Mr. Edmund Blood, who willingly devoted himself to canvassing the artists. The Consul, Mr. Proby, was possessed of the amplest information, and placed it at my service. Mr. Thomas Trollope and Mr. Montgomery Stuart showed equal courtesy and readiness. The catalogue of those whom I saw would be tedious; but few exerted their influence with greater effect than the President of the Chamber of Commerce, Signor Conti, and the Secretary of the "Accademia di belle arti," Signor Antinori. In Italy these bodies exercise a greater influence than any similar ones at home, being the only responsible exponents of the interests they represent, and the best channels for conveying information and influencing opinion.

A visit to the Marchese Ginori was highly interesting. He drove me out to breakfast at his factory, at La Doccia, where I saw the manufacture of every description of pottery, from the coarsest ware for peasant's use, to the choicest works of art, fit for a monarch's palace. The tinted figures in relief, the Majolica, and his perfect reproduction of the long-lost "cinque cento" are unrivalled. The factory possesses a select gallery of casts from the greatest statues in the world; and it may be a hint to us to know the Marquis's explanation, that its object is to train his workmen's taste and perception of beauty of form. The Terra Cotta work and statues here are very fine. He seemed unwilling to become a contributor, as he had no new designs to offer since 1862, though I assured him he had quite enough that would be new to us. The establishment had been in the family a century and a half; and this is the only instance I can recall of an Italian nobleman of wealth and position embarking steadily in industrial pursuits.

The question of admission of copies of paintings was brought under my attention by the directors of the Uffizi and Pitti Galleries. It is well known that copying is here a special vocation, and carried to great perfection. Masterpieces of world-famed artists, which no gold could purchase, and which cannot be seen but in their own galleries, may thus have some pale reflection of their beauties brought within reach of distant students. No doubt the calling is often debased, and copies are manufactured by men who are no artists; but so are all paintings. The multitude of the bad does not dim the lustre of the good. I felt this in Rome also, where were some copies made for the Pope of the grand masterpieces. For those who can never see the inspired "Conception" or "Transfiguration," it is a step to see a copy by an artist like Podesti or Ihlée. I accordingly suggested the formation of a separate department in the Exhibition distinct from the Fine Arts Gallery, for the reception of copies; but the demand for space proved so great that this could not be carried out.

An invitation from the celebrated Baron Ricasoli to visit him at Brolio was too important to be neglected. The drive from Sienna passes through one of the richest and best cultivated districts of Tuscany, and gradually rising, as it winds amid picturesque hills, at length reaches the castle, long visible from the distance, on the summit of a vine-clothed mountain. It is a fine imposing pile raised on a plateau, and fortified by lofty and solid walls. The prospect is wide and charming, and the air delicious, having the warmth of its ardent summer tempered by the elevation and the mountain breeze. A day passed with this able and enlightened nobleman was a high intellectual treat. The news of the French convention arrived during my visit, and gave unusual animation to our discussions on the varied stirring events of the time. The Baron's patriotic feelings made him enter earnestly into our project, as one that might give an additional stimulus to the commercial relations of his countrymen. Long after my departure his powerful influence served to urge forward the government and impress public opinion.

Returning, I took advantage of my neighbourhood to Sienna to go to my old friend Count Piccolomini; and soon afterwards bid adieu to Florence, only stopping to address the usual number of official letters, and to write some articles for the Italian papers; which if left to the

editors, despite their professions and good nature, would else have been indefinitely postponed. He who labours abroad for an Exhibition must learn to do everything himself!

Want of time allowed me only to peep at the Neapolitans, calling on some officials and noblemen of influence, so as to lay the foundation for further communications. I had at that time little expectations from Naples, on account of its greater distance, and my recollections of the very unbusiness-like tendencies of its clever population. It has, however, fully shared in the recent progress of the entire kingdom, and gave us excellent proofs of its vitality.

The results accomplished by the Italians are more interesting than might at first be supposed. They were the first efforts of a young kingdom escaping out of the confusion of a revolution, and as yet unprepared to put forth its own strength. For the first time the people relied on their independent efforts, not on the Government. The Italian department showed a great variety of miscellaneous products, that indicate the vast resources of this splendid country, which the inhabitants themselves are only beginning to discover. The cereal products made little show, but are of vast importance to the nation's wealth. For instance, a box of macaroni is not very attractive, but is suggestive to a thoughtful mind reflecting on the enormous quantity produced and its moderate price. The many samples and excellence of the cottons, point to a new and energetic culture. The variety of wines will, before long, form an important commerce. Unfortunately the arrangement for their sale in the building was not devised by me in time for the Italians to take advantage of it. But many samples came over, proving that nature has provided suitable soil and climate; and that when markets hitherto closed are opened to its enterprise, wine cultivation may be improved, so as to form a source of wealth to the country, and of abundant supply to other nations. Its tobacco is plentiful and cheap; and though it cannot reach the excellence of that of warmer climates, may yield an abundance of ordinary merit. Its mineral products showed greater variety than had been anticipated, the fame of its marbles having hitherto monopolised attention. Its sculptures were, of course, rich, and will probably ever continue to be so. The paintings were not numerous, but several were of large size and of great merit, forming a worthy representation of the school.

During the Exhibition the Baron Donnafugata acted as official representative of the Kingdom of Italy, and devoted many months to the superintendence of his department, aided by the Italian Consul, Signor Marani; and an accomplished Sicilian nobleman, the Duke di Brolo, attended assiduously to the important and thankless duties of a juror.

**THE ROMAN STATES.**—Knowing no politics, travelling as an ambassador of peace, I met with strange and sudden contrasts. From the Cabinet of Turin I passed to intercourse with that at Vienna. From Baron Ricasoli I changed at once to Cardinal Antonelli. Arriving, towards evening on the 22nd September, at Rome, I went to the Vatican; the Cardinal was disengaged, and sent to say he would see me. Nothing can exceed his Eminence's courtesy of manner, rapidity of comprehension, conversational power, and agreeability. He entered patiently into all details of business, but somewhat staggered me by saying the Pope had already heard of the matter, and had decided against it! It was, indeed, almost desperate to work against this foregone conclusion, and I afterwards found how much prejudice it created against us in every department of Rome. I attacked it boldly, Against what had he decided? Against a matter imperfectly understood—perhaps misrepresented; against demands on his exchequer which were never meant to be made; against an Exhibition which then was unknown, but which now had received the adhesion of every State in Europe? Would Rome, alone, be absent, and would the Holy Father not do, at least partially, for Ireland, so attached to his person, what he had done for England? I pressed on him the feeling of discouragement that would be expressed here, on hearing that Rome would not co-operate with Ireland. He explained that the real difficulty had been the dread of expense; that £5,000 had been spent in 1862, and their finances would not now bear the twentieth part of that sum. I pointed out how all should be arranged, so that literally nothing should fall on the Government, the cost of carriage being divided between the exhibitors and the Executive Committee; that we merely wished them to form a commission to superintend, to animate the artists, and correspond for them with Dublin. He finally promised to exert his influence, and to consult at once with the Pope and the Minister of Commerce. He stated that the Exhibition of 1862 had been most useful; that art was at present much depressed, and that he looked to this to give it a stimulus. When my business was concluded, I naturally rose to withdraw; but, as there was the very unusual accident of no other visitor arriving, he kindly detained me, and I passed a most agreeable evening, conversing freely on the events of the day, which I had so recently discussed with men of diametrically opposite opinions.

My next visits were to Signor Bompiani, the artist, whose experience in 1862, and official position, enabled him to give material aid; to the Consul, Mr. Severn, who was profuse in courtesy, and spared no pains; and to Baron Baldini, who is at once Minister of Commerce, Fine Arts, Agriculture, and Public Works. He was filled with the same horror of possible expense, and was sensibly relieved by my assurances. Like all others, he told me the matter practically rested with

the Cardinal, and till I received his assent nothing could be done. He objected even to my printing or distributing prospectuses. Those I had already in Italian were quite inadmissible, because they contained references to the Kingdom of Italy, which were considered highly offensive. He also pointed out the difficulty of sending goods to Leghorn, as that would involve a certain amount of communication with the Government at Turin. I had no authority to promise to take from Civita Vecchia, but undertook to recommend it strongly. On these terms he thought the Government should exert itself, to show that its subjects were as active and prosperous as ever. His Secretary, Commend. Grifi, took an earnest interest in the matter, and afterwards acted as Secretary to the Commission. The Rev. Dr. Kirby, head of the Irish College, proved a most useful friend; and Commend. Visconti strongly urged the policy of making the Roman Court surpass in beauty that of 1862.

My next visit to the Cardinal realised my hopes. The Government decided in our favour, would form a Commission, would print and circulate the prospectus, and announce the earnest wish of the Holy Father to have a brilliant contribution, fit to do honour to his rule. He, however, insisted on the necessity of taking the goods from Civita Vecchia, which I undertook to recommend, and which was afterwards conceded. He also intimated that, once in the hands of the Government, its arrangements must be absolute; and it would only be my part to aid in giving it publicity, in gaining exhibitors, and animating those who might be selected to act on the Commission.

Armed with this indispensable fiat, I found my reception everywhere sensibly changed. Cards poured in at my hotel, and everyone thought that natural and easy, which a few days before they pronounced impossible. The Chamber of Commerce, through their President, Signor Trocchi, passed a vote assuring me of support. Amongst the artists it was received with the greatest delight, and the terms offered they considered liberal. Amongst those who interested themselves, either by becoming contributors, or prevailing on others, I may mention Signor Podesti, Signor Benzonì, Herr Wolf, Mr. Gibson, Commend. Minardi, Commend. Poletti, and Commend. Tenerani.

The arrival at Rome of Monsignore Talbot, a brother of Lord Talbot de Malahide, was of material assistance at this moment. Lord Talbot was afterwards selected as the official representative of Rome at the Exhibition, with Mr. Lentaigne as his deputy. Being invited to Frescati by Prince Aldobrandini, who had acted as President of the Commission in 1862, I found him most willing to throw the weight of his influence into our plan. Count F. Antonelli, brother of the Cardinal, took up an equally strong view. Mr. Cholmely, the eminent banker, gave most practical information as to the means and costs of transport. The Directors of the railway to Civita Vecchia promised a reduction of their fares to one-half. Thus little but the cost of packing would have to be borne by the Roman artists.

Amongst my petty difficulties was the discovery of a magnificent colossal statue of Hercules. They are always digging up something at Rome, and everyone gets into a state of excitement, so that every visit on business is interrupted by a discussion on the last novelty in antiques. It was evident that my business was not half so much in the mind of my auditor as this statue, and I had to wait till he broke out on the inevitable statue, and so relieved his mind. In short, I could accomplish nothing till I, too, had seen this famous colossus, which bestrode the Roman world, and so could join in criticising its beauties.

I had also fallen on troublous times. The French convention was engrossing enough; and then came the news of the Turin riots, and the resignation of the Italian Ministry. What chance had we before events that threatened the very tiara itself? To this must be added the little value that seems attached to time. The city is well named "The Eternal;" but the representative of an Exhibition, who must fly through space if he would accomplish half his task, is made to remember, painfully, that he has not an eternity of time before him. He is looked on as most unreasonable because he asks to do, write, or discuss to-day, that which can be better done, written, or discussed on the moment, than a week hence. "Ma, quel Inglese è un lampo, un fulmine!" I might well reply, "Ars longa, vita brevis est!"

When about to leave Rome, I received from the Cardinal a letter stating that the Pope, having read and approved my letter of explanations to the Minister, had expressed a desire to honour me with an audience. For this it was incumbent on me to remain. It was meant not only as a compliment to the Exhibition and to my country, but as the public announcement of a favourable decision, most important in the eyes of the Romans. Fourteen years having elapsed since I had had a similar honour, I could judge of the effects of time, and was surprised to see how lightly it had laid its hand on Pio IX. There was the same benevolent expression, scarcely clouded by the anxieties of an eventful reign, the same quick glance of intelligence, and the clear and resonant voice, that indicates powers not yet decayed. His Holiness inquired minutely into all the circumstances and prospects of the Exhibition, and was much struck by its having been accomplished without the aid of our Government. He expressed his wish to act as liberally as









# DESCRIPTIVE CATALOGUE.—FOREIGN INDUSTRIAL DEPARTMENT.

**TABULAR STATEMENT of Foreign Countries which Exhibited at the Dublin Exhibitions of 1853 and 1865, showing the Number of Exhibitors and the Estimated Value of the Industrial Products shown:—**

	1853		1865	
	No. of Exhib.	Value £	No. of Exhib.	Value £
Africa, West, . . . . .	—	—	4	100
Austria, . . . . .	—	—	65	7,000
Belgium, . . . . .	86	5,000	165	5,800
China, . . . . .	5	—	3	2,500
Denmark, . . . . .	—	—	2	50
France, . . . . .	83	20,000	115	15,000
Italy, . . . . .	—	—	341	75,000
Japan, . . . . .	—	—	7	1,000
Liberia, . . . . .	—	—	2	50
Netherlands, . . . . .	—	—	78	2,000
Rome, . . . . .	—	—	36	3,700
Russia, . . . . .	—	—	1	150
Siam, . . . . .	—	—	1	50
Sweden & Norway, . . . . .	—	—	19	200
Switzerland, . . . . .	—	—	12	180
Turkey, . . . . .	—	—	1	5
United States, . . . . .	2	—	6	60
Zollverein, . . . . .	77	10,000	128	3,000
	254	35,000	986	115,845

This is exclusive of Fine Arts Exhibits—Paintings and Sculpture.

**Number of Foreign Exhibitors in the Industrial Department, and Distribution of Awards, Dublin Exhibition, 1865:—**

	Exhibs.	Medals	Hon. Men.
Africa, West, . . . . .	4	—	1
Austria, . . . . .	65	36	19
Belgium, . . . . .	165	94	41
China, . . . . .	3	1	—
Denmark, . . . . .	2	1	—
France, . . . . .	117	78	28
Italy, . . . . .	481	25	61
Japan, . . . . .	7	—	—
Liberia, . . . . .	2	—	1
Netherlands, . . . . .	78	20	12
Rome, . . . . .	36	18	10
Russia, . . . . .	1	1	—
Siam, . . . . .	1	—	1
Sweden and Norway, . . . . .	19	4	7
Switzerland, . . . . .	12	6	4
Turkey, . . . . .	1	—	—
United States, . . . . .	6	—	—
Zollverein—Prussia, . . . . .	128	71	31
	1,026	437	218

## AFRICA, WEST.

### West Gallery.

**1 CHURCH MISSIONARY SOCIETY, 14 Salisbury sq. London**—Two long pipes from the River Niger; native grass hat; jade bowl.

**2 LEVIN, M. L., Beris Marks, London.**—Fine collections of the various beads used in commerce with nations of Africa, India, &c.

**3 SOCIETY OF ARTS, Adelphi, London.**—Case of cottons, and illustrations of spinning processes, arranged by Mr. T. Clegg, Manchester.

**4 BOWERBANK, J. B. Cameroons.**—Dagger, calabash bottle, stool, pair of horns, bunches of oil palm nuts, four native cloths, and one small grass cloth bag.

## AUSTRIA.

### South-West of Transept and Gallery above.

Commissioner for Vienna—**HERR HENREICH**, Secretary of the Society of Arts, Tuchsleben, II.

Commissioners in Dublin—**M. CHARLES BERGER, M. BRUNO BREHLAUER.**

The extension of trade between Austria and England, engaging as it has recently done the attention of our merchants and legislators in a new commercial treaty, is a matter of interest, which of a certainty belongs to Ireland also. It is therefore pleasant to see Austrian manufacturing industry so well represented here, much if not the greater half of the credit being fairly attributable to Dr. Heinrich, the Secretary of the Chamber of Commerce, and his coadjutors, the Chevalier de Wertheim, and the Chevalier de Friedlander.

Old acquaintances of 1862 have re-appeared with the same attractiveness which then characterised the general contributions of Austria. There is the trophy-case of M. Klein, stocked more alluringly than ever with the gilt bronzes of different useful and ornamental form, the dressing-bags, the ornamental leather cigar-cases and portmanteaus, and the infinite variety of articles at once elegant and serviceable. There is the Hungarian pottery of M. Moritz Fischer, imitating the distinct styles of Dresden, Chelsea, Berlin, and the Oriental manufactures, from which admirable display the Prince of Wales selected specimens to the value of £40. There are those Viennese clocks by which M. Schonberger took high honour in the South Kensington competition, and by which he maintains a position entirely by himself here. The famous bent wood furniture, by the Brothers Thonet, so strong that a chair dashed with main force upon the floor will bound from it uninjured like an India rubber ball, and so durable in the absence of all glued joints that rough wear seems to have no effect on it, is exhibited in many shapes, all simple, and some elegant in their simplicity.

Wine-growing Austria, yet to be known and appreciated in the British Isles, puts in an appearance here, by the excellent productions of Count Zichy-Ferraris, Bishop Ranolder, and Mr. R. Schlumberger, of Vöslau. The last, whose agent is Mr. F. Andres, has indeed gained some footing in England, the high per centage of vinous strength having recommended the different growths of Mr. Schlumberger's vineyards to the notice of physicians, and led to their use in Greenwich Hospital, as well as in the army hospital of the south camp at Aldershot. The higher class of his red wines vie with the best produce of Burgundy; and there is a white wine bearing his name which deserves the distinction of being tasted as a liqueur, so fragrant is its bouquet. From wines to Maraschino—remembering the witty toast which poor Lady Morgan was wont to match with that of "Women and Wine"—is an easy—perhaps a too easy—step. The Maraschino of Luxardo, of Zara, matchless anywhere, is here, to assert the Dalmatian supremacy of this liqueur over that of any other country; and the excellent variety of liqueurs by Casimir Bauer, which obtained him a medal in 1862, will be found in the same good company. The English firm of E. A. Paget, now in Vienna, sends a noticeable collection of waterproof stuffs; and the rising manufactures of woollens are represented solely by Horachmann, of Brünn, in Moravia; while in the section of linen goods, J. D. Pick, of Nachod, in Bohemia, is likewise alone.

## SECTION II.—CHEMICAL AND PHARMACEUTICAL PROCESSES AND PRODUCTS GENERALLY.

- 1 PETRICIOLI, S. (heirs of) *Zara, Dalmatia*.—Bleached wax and wax candles.  
3 LOKHNERT, H. *Böhmisch Leipa, Bohemia*.—Substitutes for gum, dextrine.

## SECTION III.—SUBSTANCES USED AS FOOD.

- 4 RAHOLDER, S. Bishop of Veszprim, *Hungary*.—Hungarian wines.  
5 BARUBB, M. *Podgorze, near Cracow*.—Flour.  
6 BAUER, C. *Vienna, Taborstrasse 11*.—Liqueurs.  
7 CALLIGARICH, C. *Zara, Dalmatia*.—Maraschino liqueurs.  
8 FLANDORFER, J. *Oedenburg, Hungary*.—Hungarian wines.  
9 KOENTZER, J. *Biola, Galicia*.—Liqueurs.  
10 LUXARDO, G. *Zara, Dalmatia*.—Maraschino.  
11 POKORNY, F. *Agram, Croatia*.—Liqueurs and spirits.  
12 SCHLUMBERGER, R. *Vöslau, near Vienna*.—Wines.  
13 SZEGSZARD WINE TRADING COMPANY, *Szegszard, Hungary*.—Wines.  
14 ZICHY-FERRARIS, Count E. *Nagy, Szöllös, Papa, Hungary*.—Hungarian wines (Somlyo).  
15 ZICHY-FERRARIS, Count H. *Oedenburg, Hungary*.—Wines (Tokay).

## SECTION VII.—CIVIL ENGINEERING, AGRICULTURAL AND BUILDING CONTRIVANCES.

- 16 SCHURRER, T. *Vienna*.—Holf Rouleaux, patent wooden window blinds.

## SECTION X.—PHILOSOPHICAL INSTRUMENTS; MUSICAL INSTRUMENTS.

- 17 PERPLER, J. *Rochusgasse 6*.—Philosophical instruments.  
18 OLBRICH, J. *Vienna, Mariahilferstrasse 103*.—Musical boxes, playing Irish, Scotch, English, German, and Italian melodies.—(*Great Music Hall*.)  
19 SPOWASSER, J. *Vienna, Langegasse*.—Musical instruments (brass).—(*Music Hall*.)

## SECTION XII.—WOOLLEN AND WORSTED.

- 20 HORSCHMANN, H. *Brünn, Moravia*.—Woollen stuffs.

## SECTION XIV.—MANUFACTURES FROM FLAX AND HEMP.

- 21 PICK, J. D. *Nachod, Bohemia*.—Linen.

## SECTION XVI.—LEATHER.

- 22 URBAN, M. *Vienna*.—Fancy articles in leather.  
23 NEIDER & BREITER, *Vienna, Lindengasse 14*.—Fancy articles in leather.  
24 JANESECH, E. *Klagenfurt, Carinthia*.—Tanned leather.  
24A KLEIN, A. *Vienna, Andreasgasse*.—Articles in leather, wood, and bronze.—(*Nave*).

The most conspicuous object in the nave, after the canopied decoration of Jackson and Graham, was the large case containing a most extensive selection (exhibited by the English agent, Mr. Edmonds, of Baker-street) of the fancy articles, table ornaments, dressing, writing, travelling, and other requisites, in leather, ornolu, &c., manufactured by A. Klein, of Vienna, and which has come into such general use since Herr Klein's display under the western dome in the Exhibition of '62. We suppose these goods have superseded

those of a similar kind by French manufacturers chiefly on account of their cheapness; but they are, at the same time, tasteful in design and more thoroughly finished than French articles of the same description are apt to be. Beyond this, and another case of fancy articles, in leather, wood, &c., by Neiber and Breiter—and if we except some cheap and not very successful imitations of Sevres, Dresden, and other descriptions of china, certain clumsy imitations of armour, and a stand of "Bohemian glass"—there is nothing from Austria or the other German States imperatively demanding notice here.

## SECTION XVII.—PAPER AND STATIONERY, PRINTING AND BOOKBINDING.

- 25 KNEPPER, W. & Co. *Vienna, Wiedner, Hauptstrasse 51*.—Stained and cigarette paper.  
26 BACHBACH, J. J. *Vienna, Fleischmannsgasse*.—Sealing stamps.  
27 HARTINGER, A. & SON, *Vienna, Mariahilferstrasse 117*.—Lithographs, oil colour prints, and chromo-lithographs.  
28 LECHNER, RODOLPHE, *Vienna, Grabengasse*.—Educational works, books for children.—(*Gallery*).  
29 REIFFENSTEIN & ROESCH, *Vienna, Oircusgasse 3*.—Lithographs, chromo-lithographs, and illustrated publications.  
29A WINTERNITZ, C. *Vienna, 163 Hauptstrasse*.—Games for youth.

## SECTION XX.—ARTICLES OF CLOTHING FOR IMMEDIATE PERSONAL OR DOMESTIC USE.

- 30 JAQUEMAR, G. *Vienna, Herrengasse*.—Leather gloves.  
31 GIANI, J. & C. *Vienna, Dreilaufergasse 3*.—Embroidered and woven stuffs for ritual garments.  
32 HARN, L. *Vienna, Kollnerhofgasse 1*.—Fancy shoes.  
33 KUMPF, PIUS, *Schluckenau, Bohemia*.—Plait work, table coverings, hats, caps, bonnets, waistcoats.  
33A BRAND & Co. *Vienna*.—Woven and embroidered buttons.

## SECTION XXI.—IRON AND GENERAL HARDWARE.

- 34 BODE, F. M. *Vienna, Franzengasse 7*.—Coffee roasters, churns, egg beaters.  
35 KOLBENHEIMER, E. *Vienna, Mitterteig 16*.—Britannia metal wares.  
36 MILLER, M. & SON, *Vienna, Webgasse 26*.—Pianoforte wire, cast-steel rollers and tools.  
37 WERTHEIM, F. & Co. *Vienna, Tuchlauben 11*.—Fire-proof safes.

## SECTION XXIII.—WORKING IN PRECIOUS METALS, AND IN THEIR IMITATION; JEWELLERY, AND ALL ARTICLES OF VERTU AND LUXURY, NOT INCLUDED IN OTHER CLASSES.

- 38 KRESPACH, A. *Vienna, Kandlegasse 9*.—Clocks and clock cases.  
39 NEUSTADTL, M. H. *Prague, 403 I*.—Articles in gold and silver and jewellery.  
40 SCHÖNBERGER, W. *Vienna, Franz Josef Quai*.—Clocks.

## SECTION XXIV.—GLASS.

- 41 BRAUN, H. *Queen's Head Passage, 1 & 2 Newgate st. London*.—Bohemian glass.  
42 FRANK, J. *Vienna, Langegasse 17*.—Span-glass brooches, hair-pins, &c.  
43 REICH, S. & Co. *Langenau, near Haida, Bohemia*.—Glass.

## SECTION XXV.—CERAMIC MANUFACTURES, PORCELAIN, EARTHENWARE, &amp;c.

- 44 JABUREK, F. *Vienna, Gumpendorfergasse 41.*—Meerschaum articles.  
 45 BRUENNER, BROTHERS, *Vienna, Magdalenenstrasse 10.*—Petroleum lamps.  
 46 FISCHER, M. *Herend, Veszprim, Hungary.*—Porcelain services.  
 47 TREBITSCH, A. *Vienna, Hundskirchnerstrasse 7.*—Meerschaum articles.  
 48 GOLDMANN, M. *Vienna, Webgasse 3.*—Meerschaum articles.

## SECTION XXVI.—DECORATIVE FURNITURE AND UPHOLSTERY, INCLUDING PAPER-HANGINGS, PAPIER-MACHÉ, AND JAPANESE GOODS.

- 49 STUMMER, A. *Vienna, Hungelbrungasse 21.*—Wooden fans.  
 50 KERN, C. G. *Vienna, Salesianergasse 8.*—Imitations of arms, trophies, and other ornaments in carton-pierre.  
 50A KITSCHELL, heirs of, *Vienna.*—Iron furniture.  
 51 PODANY, F. & M. *Vienna, Westbahnstrasse 32.*—Mosaic veneers for fancy cabinet work.  
 52 RAINER, M. VON, *Vienna, Schleifmuhlgasse 15.*—Articles carton-pierre and stag-horn.  
 53 SOHOENTHALER, F. Sculptor, *Vienna, Sofiengasse 1.*—Carved wood furniture.  
 54 SIEBURGER, R. & B. *Prague, Bohemia.*—Paper hangings for counters, railway stations, &c. representing a railway map.  
 55 THONET BROTHERS, *Vienna, Untere, Donaustrasse 1.*—Bent wood furniture.

## SECTION XXVII.—MANUFACTURES IN MINERAL SUBSTANCES USED FOR BUILDING OR DECORATION, &amp;c.

- 56 KUPFEL, A. *Vienna, Lothringerstrasse 3.*—Mosaic asphalt floor.

## SECTION XXVIII.—MANUFACTURES FROM ANIMAL AND VEGETABLE SUBSTANCES, NOT BEING WOVEN OR FELTED, OR INCLUDED IN OTHER SECTIONS.

- 57 PAGET, E. A. *Vienna, Rimergasse 15.*—Water-proof stuffs; American leather cloth.

## SECTION XXIX.—MISCELLANEOUS MANUFACTURES.

- 58 SEIDAN, W. *Vienna, Mariahilferstrasse 85.*—Fancy articles with incrustations of enamel.  
 59 FURETH, B. *Schuttenhofen, Bohemia.*—Lucifer matches.  
 61 SCHREIDER & GRIESHEIM, *Laiibach, Carniola.*—Machine-made wood for lucifer matches.

## BELGIUM.

South-east of Transept.

## COMMITTEE IN BRUSSELS.

- M. FORTAMPS, Senator.  
 M. COBB VANDER-MAELEN.  
 M. JULES KINDT, Industrial Inspector, &c.

## SECRETARIES.

- M. DULIEU.  
 M. C. J. CLERFEY, Assistant.  
 Office—30, Avenue de la Toison d'Or.  
 Commissioner in Dublin—CHARLES PALGRAVE, Esq.,  
 Consul for Belgium.

## SECTION I.—MINING, QUARRYING, METALLURGICAL OPERATIONS, AND MINERAL PRODUCTS.

- 1 AMAND, A. *Bourignes, near Dinant, Prov. of Namur.*—Charcoal castings.  
 2 AMAND, E. *Mettet, Prov. of Namur.*—Cast iron and wrought iron.  
 3 BLONDIAUX & Co. *Thy-le-Château, Prov. of Namur.*—Rails for railroads.  
 4 BRINCOURT, L. *Herbeumont, Prov. of Luxembourg.*—Various kinds of slate.  
 5 COUPERY DE ST. GEORGES, E. *Dinant, Prov. of Namur.*—Black marble in polished slabs and blocks.  
 6 DASSONVILLE DE ST. HUBERT, L. *Namur.*—Belgian millstones (silicious).  
 7 MÜLLER, H. & Co. *Engis, Prov. of Liège.*—Miners' augers.  
 8 SOCIÉTÉ DES FORGES DES ZONE, *Marchienne-au-Pont, near Charleroi.*—Iron bars, sheet iron, and forged iron.  
 9 SOCIÉTÉ ANONYME DES HAUTS FOURNEAUX ET LAMINOIRS, *Montigny-sur-Sambre, near Charleroi.*—Steel castings.  
 10 VAN GODTSSENHOVEN, A. *Louvain.*—Ores of iron.  
 11 VERDIST-LAMAL, R. *Brussels.*—Black marble from Basècles.  
 12 WATRISSE, L. *Dinant.*—Black and blue marble in a rough and finished state.

## SECTION II.—CHEMICAL AND PHARMACEUTICAL PROCESSES, AND PRODUCTS GENERALLY.

- 13 BRASSEUR, E. *Ghent.*—White lead and ultramarine blue.  
 14 BRUNEL & Co. *Ghent.*—Chemical products derived from the carbonization of wood: acids, acetates; vinegar, oil, and alcohol from wood.  
 15 DE CARTIER, A. *Auderghem, near Brussels.*—"Minium de fer d'Auderghem," a preservative paint for iron and wood.  
 16 DELMOTTE-HOORMAN, C. *Mariakerke, near Ghent.*—White lead.  
 17 DEPREZ HENIN, *Châtelet, near Charleroi.*—Pure Wheat starch.  
 18 HOOBICKX & GOBBISSEN, *Brussels.*—Minium of iron; various kinds of ochre.  
 19 MERTENS, B. & Co. *Lesines, Prov. of Hainault.*—Lucifer matches.  
 20 MERTENS, G. *Overboelacre, near Grammont.*—Lucifer matches; blacking.  
 21 RENT & Co. *Louvain.*—Rice starch.  
 22 SEGHEES, B. *Ghent.*—Bone black.  
 23 SMAELEN, P. *Brussels.*—Copal Varnish.  
 24 VAN GESTERUYEN-EVERAERT, J. C. & SISTER, *Hamme, near Termonde.*—Starch made from damaged wheat.

## SECTION III.—SUBSTANCES USED AS FOOD.

- 25 BLAESS, C. B. *Borgerhout, near Antwerp.*—Vinegar.  
 26 BLONDIAU, V. *Alost.*—Glucose, syrups, and isinglass.  
 27 BORTIER, P. *Ghistelles, West Flanders.*—Polype limestone exhibited as a fertilizing agent.  
 28 DE BISEAU, T. *Entremont, near Binche.*—Wheat; oats.  
 29 DEGRYSE-QUAGHEBOER, *Poperinghe.*—Hops.  
 30 DE MAN, J. *Antwerp.*—Cigars in boxes.  
 31 DEYMANN-DRUABT, *Charleroi.*—"Deymann bitter," a stomachic liqueur.  
 32 DUREZ, J. B. D. *Brussels.*—"Nectar du Brabant," a liqueur.  
 33 IHMDAHL, C. *Brussels.*—"Elixir des Ardennes," a liqueur.  
 34 LEFEBVRE, W. W. & SON, *Braine-le-Comte*—Liqueurs.

- 35 LEHON, F. AIXE, *Brussels*.—Liqueurs.  
 36 LERAPFRE, A. *Gheluwe, West Flanders*.—Leaf tobacco.  
 37 MASQUELIER-HORTA, A. *Ghent*.—Liqueurs.  
 38 MIRLAND & Co. *Frameries*.—Apple paste.  
 39 PEERS, Baron, *Oostcamp, West Flanders*.—Rye grown in newly cleared land.  
 40 ROBILLARD, J. B. *Hensies, Prov. of Hainault*.—Hops, wheat, and beer.  
 41 SCHAUTIN, PIERRE, & Co. *Spa*.—Liqueurs.  
 42 STEENS, H. *Schooten, Prov. of Antwerp*.—Cereals; kidney beans.  
 43 VAN BUTSELE, G. *Nukerke, near Oudenarde*.—Cereals.  
 44 VAN BUTSELE, W.W. *Nukerke*.—Beer.  
 45 VANDEN BERGH & Co. *Antwerp*.—Gin; alcohol; bitters.  
 46 VANDE VELDE, N. *Ghent*.—Liqueurs; champagne beer.

#### SECTION IV.—VEGETABLE AND ANIMAL SUBSTANCES CHIEFLY USED IN MANUFACTURES AS IMPLEMENTS OR AS ORNAMENTS.

- 48 CLAUDE, L. *Brussels*.—Refined Colza oil.  
 49 DE CURT, W.W. *Gendbrugge, near Ghent*.—Distilled stearine and candles.  
 50 DERMOTTE, H. *Ghent*.—Prepared bristles.  
 51 DE NAYER, P. F. *Lebbeke, near Alost*.—Artificial wool (shoddy).  
 52 DUREZ, I. B. D. *Brussels*.—Perfumery.  
 53 MERTENS, CH. *Gheel, Prov. of Antwerp*.—Flax scotched by machinery, patented by exhibitor.

Belgium has long been considered almost unapproachable in the quality of her flax fibre; and its export to Great Britain and Ireland, France, Spain, and Italy, is a very important source of wealth to that industrious State, reaching an average annual value of £800,000. Few sorts of Belgian flax bring under £70 per ton; and upwards of £150 or £160 is paid for the finer kinds, while the latter have been occasionally sold at upwards of £200 per ton. But even this high price is greatly outdone by the fibre from which the Mechlin and Brussels lace is made, as it has been known to sell at £4 per pound weight when hackled, or nearly £9,000 per ton! Yet, even in this extreme case, so little does the value of the material enter into that of the exquisitely fine and tasteful product, that a lace handkerchief, weighing about two ounces, has been sold for 2,500 francs, or £100. The sums received by the Belgian farmers for their flax crop are such as to appear almost fabulous; £40 to £60 per acre being quite a common return, and for the very finest kinds, sometimes £80 to £100 per acre. The manufacturers of Leeds and Belfast are the best customers for this fine fibre, the higher numbers of yarn, those from 160 leas (fifteen hanks to the pound) and upwards, are almost exclusively spun from Belgian flax. Some of the Belfast spinners send their buyers regularly to the Belgian districts to select the flax on the spot. To produce the sort of fibre for the lace manufacture great care and attention are requisite. The richest and most pulverized soil is chosen; the seed is sown about double the usual thickness; and every weed carefully eradicated from time to time. Branches and stakes are fixed in the ground, with lines intersecting like the meshes of a net, in order that the wonderfully fine stems of the flax, as they grow up, may have support, as otherwise they would be prostrated with the first high wind or heavy shower. The stems are pulled green and steeped, and the utmost pains are taken to pick out coarse stalks. When scotched the fibre is again most carefully examined, and every filament which shows any defect is removed. The yield of this lace flax is, of course, not large, and great expense is incurred in the details of management and preparation; but the profits are nevertheless extraordinary.

- 54 HANSOTTE, BROTHERS and SISTER, *Huy*.—Glue.

- 55 LAMBRECHTS, J. C. & Co. *Antwerp*.—Soaps; perfumery.  
 56 LAURENT, BROTHERS, *Waterloo, near Brussels*.—Toilet and household soaps.  
 57 LEFEBURE, J. *Brussels*.—Fax and hemp, prepared.  
 58 LUYCKX, G. *Brussels*.—India rubber prepared for manufacturing purposes, surgery, and haberdashery.  
 59 MASCHELIN, A. *Gheluwe, near Courtrai*.—Raw flax.  
 60 MECHANT, H. *Hammé*.—Flax.  
 61 PEERS, BARON E. *Oostcamp, near Bruges*.—Raw flax and hemp grown in a heathy soil.  
 62 TAULEZ-BOTTÉLIER, C. *Bruges*.—Peeled flax.  
 63 VERBESSEM, C. *Ghent*.—Glue and gelatine.  
 64 VERCRUYSSSE BRACQ, F. *Deerlyk, near Courtrai*.—Flax, raw and prepared.

#### SECTION V.—MACHINES FOR DIRECT USE, &c.

- 65 CAIL, J. F., HALOT A & Co. *Molenbeck-St. Jean, near Brussels*.—Portable steam engine. — (*Machinery Court*.)

#### SECTION VI.—MANUFACTURING MACHINES AND TOOLS.

- 66 AERTS, BROTHERS & Co. *Brussels*.—Ventilating apparatus.  
 67 CAIL, J. F., HALOT A. & Co. *Molenbeck-St. Jean, near Brussels*.—Radial boring machine; three slides; transverse planing machine. — (*Machinery Court*.)

#### SECTION VII.—CIVIL ENGINEERING, ARCHITECTURAL, & BUILDING CONTRIVANCES.

- 70 BEERNAERT, A. *Auderghem, near Brussels*.—Two marble chimney-pieces.  
 71 DELPERDANGE, V. *Brussels*.—Water and gas-pipes, joined by a new process.  
 72 LECLERCQ, A. J. *Brussels*.—Two marble chimney-pieces.

#### SECTION VIII.—NAVAL ARCHITECTURE AND MILITARY ENGINEERING, ORDNANCE, ARMOUR, AND ACCOUTREMENTS.

- 73 BAYET, BROTHERS, *Liège*.—Ornamented fire arms.  
 74 DITE, A. J. *St. Gilles, near Brussels*.—Copper cartridges for revolvers, and bushes for Lefauchaux guns.  
 75 DUMOULIN-LAMBINON, *Liège*.—Ornamented guns; rifles and pistols on Flobert's principle; pistols and revolvers.  
 76 JANSEN A. *Brussels*.—Fowling pieces and ornamented fire-arms.

#### SECTION IX.—AGRICULTURAL AND HORTICULTURAL MACHINES AND IMPLEMENTS.

(At the Agricultural Hall, Kildare street.)

- 77 BERCKMANS, J. F. *Blaesvelt, near Mechlin*.—Improved plough.  
 78 KAIL, HALOT & Co. *Molenbeck-St. Jean, near Brussels*.—A corn mill on Falguiero's principle.  
 79 DELSTANCHÉ, P. *Marbais*.—Agricultural machines.  
 80 LEBŒUF, F. *Bassilly*.—Reaping implements.  
 81 LÉCOMTE, P. J. *Pont-à-Celles*.—Iron plough with double mould board.  
 82 WOUTERS, J. F. *Nivelles*.—Double-acting fan; grain sorter; sack lifter.

#### SECTION X.—PHILOSOPHICAL INSTRUMENTS AND MUSICAL INSTRUMENTS, &c.

- 83 CABETTE-DOBBERL, D. *Meulebeke, West Flanders*.—A lightning conductor.  
 85 SOCIÉTÉ ANONYME POUR LA FABRICATION DES GRANDES ORGUES, ESTABLISHMENT OF MEKELIN-SCHUTZ, *Ixelles*.—Organs, harmoniums.







- 86 STERNBERG, L. *Brussels*.—Two pianofortes.  
 87 VANDEN-HEUDE, R. *Steenhuyzen Wynduyzen, near Alost*.—"Sondes œsophagiennes."  
 88 VUILLAUME, N. F. *Brussels*.—Violins, violoncellos, alto. — (*The Musical Instruments are in the Great Concert Hall.*)

## SECTION XI.—COTTON.

- 89 NICOLET & Co. *Cureghem*.—Sewing thread, &c.

## SECTION XII.—WOOLLEN AND WORSTED.

- 90 GAROT, J. *Verriers*.—Woollen stuffs for trousers.

## SECTION XIV.—MANUFACTURES FROM FLAX AND HEMP.

- 91 DE BRANDT, J. *Alost, East Flanders*.—Damask table linen.  
 94 STERNACKERS, C. *Turnhout*.—Linen.  
 95 VAN DAMME, BROTHERS, *Roulers*.—Blue linens.  
 96 VAN DE WINCKELE, BROTHERS, & ALSBERG, *Ghent*.—Bleached linen thread.  
 97 VAN HARKEN, J. A. *Zede, East Flanders*.—Hemp rope, hand made.

## SECTION XVI.—LEATHER, SADDLERY AND HARNESS, SKINS, FURS, HAIR, &amp;c.

- 98 ARRETS-WUYTS, G. *Aerscol, Prov. of Brabant*.—Leather, vamps, &c.  
 99 DECLERQ, VAN HAVERBEKE, *Iseghem*.—Strong sole and varnished leather.  
 100 EVERAERTS, C. *Wavre*.—Upper leathers, &c.  
 101 FETU & Co. *Brussels*.—Engine straps; leather tubes; waterproof cloth tills.  
 102 HESNAULT A. & SON, *Ghent*.—Rabbit skin finished; hare and rabbit fur.  
 103 LEMAISTRE & Co. *Brussels*.—Engine straps and leather ropes.  
 104 SCHOVAERS & COLLET, *Cureghem, near Brussels*.—Varnished leather.  
 105 VANDEN BOS-POELMAN, *Ghent*.—Boots.  
 106 WATRIGAN, T. A. *Brussels*.—Boots and shoes.

## SECTION XVII.—PAPER AND STATIONERY, PRINTING AND BOOKBINDING.

- 107 ASSELEBERGHS-LEQUINE, *Brussels*.—Letter paper.  
 108 BEPOLS & DIEBCKX, SON, *Turnhout*.—Playing cards; fancy paper; bound books.  
 109 CALLEWAERT BROTHERS, *Brussels*.—Atlases; method of writing.  
 110 CLAESSEN, C. H. *Liege*.—Illustrated works.  
 111 GABRIEL, C. *Braine l'Alleud*.—Pasteboard.  
 112 MAGNE, F. *Brussels*.—Specimens of calligraphy.  
 113 PLANCHE, V. *Brussels*.—Ink.  
 114 VAN DOOSSELAERE, J. S. *Ghent*.—Typography.  
 115 WEISSENBRUCH, M. *Brussels*.—Books.  
 116 WYNANTS, C. *St. Josse-ten-Noode, near Brussels*.—Copying press.

## SECTION XVIII.—WOVEN, SPUN, FELTED, AND LAID FABRICS, WHEN SHOWN AS SPECIMENS OF PRINTING OR DYEING.

- 117 IDIERA, E. *Auderghem*.—Dyed cotton yarns.

## SECTION XIX.—TAPESTRY, INCLUDING CARPETS AND FLOOR CLOTHS, LACE, AND EMBROIDERY, FANCY AND INDUSTRIAL WORKS.

- 118 BEELS, D. & SISTER, *Ghent*.—Brussels lace.  
 119 DENIS, J. *Brussels*.—Gold embroidery.  
 120 GHYS-BRUYNEEL, P. F. *Grammont*.—Black lace.  
 121 GHYSELS & Co. *Brussels*.—Brussels lace.  
 122 HOORICKX & Co. *Brussels*.—Brussels lace.  
 123 HOUTMANS, A. J. *Brussels*.—Designs for lace.  
 124 HOUTMANS, C. C. *Brussels*.—Designs for lace.

- 125 RAY, Mrs. S. *Brussels*.—Lace.  
 126 STOCQUART BROTHERS, *Grammont*.—Black lace.  
 127 VAN DER DUSSEN-D'HABBEKE, *Brussels*.—Designs for lace.  
 128 VAN ROSSUM, J. B., *Hal*.—Lace.

## SECTION XX.—ARTICLES OF CLOTHING.

- 129 FREMAY BROTHERS, *Roclenge, Prov. of Limbourg*.—Straw plait; straw bonnets and hats.  
 130 LAINGLET, J. *Brussels*.—Silk corset.  
 131 LIEVAIN, L. *Mecklin*.—Silk and felt hats.  
 132 VAN NIJHUYENBERG, BROTHERS, *Lokeren*.—Silk and felt hats.

## SECTION XXII.—IRON AND GENERAL HARDWARE.

- 133 BAYARD, M. *Herstal, near Liege*.—Coach wrenches, compasses, bolts, screws.  
 134 CANIVEZ, J. B. *Ata*.—Zinc letters.  
 135 DELLOYE-MARSON & Co. *Laeken*.—Forged and cast iron, tinned and enamelled.  
 136 FAUCONIER-DELIRE, Ww. *Châtelet*.—Hand-wrought iron nails.  
 137 HOORICKX, G. *Brussels*.—Iron safes.  
 138 LAMBERT, Ww. *Charleroi*.—Rivets, bolts.  
 139 MATHYS-DECLERCK, J. P. *Brussels*.—Iron safe.  
 141 NICAISE, P. & N. *Marcinelle, near Charleroi*.—Bolts, screw plates, borers.  
 142 RAIKEM-VERDOIS, *Liege*.—Sheet iron.  
 143 TREMOURoux BROTHERS & DE BURLET, *St. Gilles, near Brussels*.—Household articles, tinned and glazed.  
 144 VERLAINE BROTHERS, *Liege*.—Iron safe.

## SECTION XXIII.—WORKING IN PRECIOUS METALS, AND IN THEIR IMITATION; JEWELLERY, AND ALL ARTICLES OF VERTU AND LUXURY, NOT INCLUDED IN OTHER CLASSES.

- 145 BOGAERTS, A. *Antwerp*.—Bronze timepieces and vases. (For illustration see page 398.)

Among the many bronzes shown there was none more quaint and meritorious, in its way, than the group on the timepiece, of which an engraving is given. There is here no weak attempt (such as we often see) to obviously associate the figures with the clock; they are apparently placed quite arbitrarily over it. We simply have here a burgher and his wife of the fifteenth century—dressed in the Oriental silks and rich stuffs for which Ghent, Bruges, and Antwerp had become the great northern emporia—looking with interest from a balcony such as may still be seen over the porch or before the windows of some old Flemish buildings. But Albert Durer in carving, and Van Eyck and Memling, with that modern-medieval Fleming, Henri Leys, in painting, could hardly have given us two figures more true to the period, as far as regards character and costume, than this very life-like and well modelled group; while Quentin Matsys himself might have turned out the hammered iron railing, so cleverly imitated in bronze. Truly, nothing proves the national vitality of the Belgian school more than to find such art as this in a common chimney ornament.

- 146 DUFOUR BROTHERS, *Brussels*.—Monstrance; chalice; beer-cup, &c.

- 147 HOKA, A. *Liege*.—Specimens of engraving on platinum.

- 148 SANDOX, V. *Brussels*.—A casket and paten in engraved silver.

## SECTION XXIV.—GLASS.

- 149 BENNETT & BIVORT, *Junet*.—Window glass.  
 150 DE DOBLODOT DE MORIAME AINE & FILS, *Lodelinsart*.—Window glass.  
 151 DE KROGHEL, J. *Brussels*.—Stained glass.  
 152 LEDOUX, J. B. *Junet*.—Window glass.  
 153 MONDRON, L. *Lodelinsart*.—Window glass.





## DENMARK.

East Gallery, over Transept.

COMMITTEE IN COPENHAGEN.

W. J. TURNER, Esq., H.B.M. Consul.  
Professor HUMMELL.

## SECTION VII.—CIVIL ENGINEERING, ARCHITECTURAL AND BUILDING CONTRIVANCES.

1 CULMSE, F. & SON, *Harreholm, near Copenhagen*.—Machine made boards, to serve as substructure on iron-clad ships; machine-made boards for floors, ceilings, and wainscots; boards for coffers and bookbinding, brown and yellow; press boards, glazed and unglazed; boards for touchwood, prepared and unprepared.

2 JANSEN BROTHERS, *Faaborg*.—Chaff-cutting machines.—(*Agricultural Hall, Kildare st.*)

## FRANCE.

West Centre of Transept and Apse, and Gallery above.

COMMITTEE IN PARIS.

M. SAVOYE.

M. S. FERGUSON, *filis* (special for Class C).M. TOLHAUSEN, *Secretary*.

*Delegates of the French Government in Dublin*.—M. CARROU; M. LIVIO, Consul for France.

The following official correspondence passed relative to the French Department:—

Foreign Office, February 17th, 1866.

SIR,

With reference to your letter of the 14th instant, I am directed by Earl Russell to request that you will inform the Executive Committee of the Dublin Exhibition of 1865, that his Lordship has instructed Her Majesty's Ambassador at Paris to submit to the Imperial Government their request that a French Commissioner should be nominated to visit Dublin.

I am, Sir,

Your most obedient humble servant,

(Sig.)

E. HAMMOND.

C. E. BAGOT, Esq.,

Exhibition Palace, Dublin.

Exhibition Palace, Dublin, March 3rd, 1865.

M. SAVOYE,

Palais de l'Industrie, Porte 1,  
Champs Elysées, Paris.

DEAR SIR,

The Emperor has written for particulars as to the wishes of the Executive Committee relative to the manner and extent of His Majesty's contribution; and in order to arrange these details to His Majesty's satisfaction, they send over Mr. H. Macdonnell, who will be at Meurice's Hotel on Monday, March 6th.

Mr. Macdonnell will also be the bearer of the instructions of the Executive Committee as to the allocation of the French space, and will be furnished with maps and all necessary details. Please to give Mr. Macdonnell any information and assistance he may require.

I am, dear Sir, yours faithfully,

C. E. BAGOT,

Secretary Executive Committee.

Among the foreign nations contributing, France held the most prominent place—her allotted space being in the east transept, and along the adjacent part of the nave. Taking the court in order, first came the very fine bronzes of Barbedienne, of Paris, shown by Messrs.

Jackson and Graham, of London. A figure of Penelope, with her distaff, mourning for the absence of Ulysses, is remarkably well modelled. A faun playing on a flute, and a hunter resting, are distinguished by the excellence of their attitudes and the perfection of their finish. Reproductions of Lorenzo de Medici's "Thinker," of Michael Angelo's "Moses," and of the top of a tomb in the Vatican, moulded after M. Angelo, and adapted to a clock, are admirable specimens of bronzes. But, perhaps as being more novel, the ornolu enamels attracted greater attention. Barbedienne sent some marvellous specimens of this kind of work—some crucifixes and crosses being notable, while vases, tazze and lamps, in this enamel applied to Algerian onyx, were worthy of patient examination as works of high art at a very moderate price. Than this stand there was hardly anything more attractive in the Exhibition. The reproduction of the Limoges enamels on copper were perfect. The Sèvres china exhibited by the French Government was hardly so good as has been seen elsewhere; but overhead every eye was attracted to a piece of Gobelins tapestry, made in 1861, and reproducing, in tints so soft that the original artist would be as much surprised as delighted, the celebrated "Vierge aux Poissons." Two pieces of tapestry, finished in 1863, by Murier, after Watteau, are also marvellous specimens of the Gobelins work. The Beauvais tapestry in the court was very good indeed.

The bronzes shown by Miroy, Freres, et Fils, were admirable, especially two pages by Salmon, perfect as works of art. Two figures after Vandyke, by the same artist, proved that he is as great in adaptation as in original conception. A Bacchante, by Clodion, was also a remarkably good bronze; and on the stand were many smaller works of great merit. Some Verde antiques, shown by Barbezat, of Val d'Osne, the largest manufacturer in France, deservedly attracted attention; but of all the modelling in bronze, perhaps the specimens best calculated to please the general visitor were seven small figures called "The Athletes," modelled by our own Durham, but finished in France. Than the attitudes of the boy bowling, the boy catching, the boys with the oars, and the boy resting, there could, perhaps, be shown nothing better in metal. An ebony cabinet, inlaid with brass, near the stand of Messrs. Jackson and Graham, was excellent. Le Roy et Fils, of the Palais Royal, showed some beautiful foreign watches, got up with exquisite taste, and of very great value. One with the royal arms of England in enamel, another, the back of which was a mass of rubies and diamonds, was only exceeded by a third in delicate enamel, showing ivy leaves. Their piping-bullfinch also drew many visitors.

Fourdinois, of Paris, sent some furniture, which was really good. A walnut sideboard, in the Renaissance style, standing in the nave, was beyond question one of the gems of the Exhibition. A plaque of silver, with a portrait of Lord Palmerston, was a very fine example of sculpture in metal; and in proper connexion with this court may be mentioned—although it was to be seen at the case of Messrs. Aubert and Linton, in the nave—a very splendid set of pink coral jewellery. It took close on twenty years to collect the coral, which was all picked for tint; and it has been put together with consummate art, and to great effect. Admirable as was some of the coral jewellery in the Exhibition of 1862, there was nothing in artistic merit at all approaching this, and the visitor owed the delight with which he viewed it to a French workman, M. Gismondi, of Nice.

In textile fabrics there was not such an extensive show as in 1862, but there were here some articles with which the most lovely fabrics of three years ago would not bear a moment's comparison. Chief, was a white silk dress, shown in their very handsome case, by Chs. Berteaux et Cie, of Paris, who had also a number of other dresses, with scarfs and shawls, *en suite*, the taste of which was as excellent as the embroidery was superb. But, far above any comparison, was the white silk—the Alexandra Dress—made up, the better to show its





beauties, a running border of flowers and of leaves, rich in colour, covered the bottom of the dress, and on each "breadth" were worked figures of tropical birds and butterflies, copied from nature, and being exact representations of all the beautiful markings which distinguish the air dwellers of the sunny south. The variety of the embroidery, as well on the skirt as on the corsage, all done by handwork in Paris, was one of the best features of the dress, the wholesale price of which would be about 70 guineas. It was such a dress as might fitly be worn by a princess, and form the chief treasure of her wardrobe. There were some good laces in the adjoining cases, and some tolerable ecclesiastical embroideries by Gros and Son, in the gallery overhead. Next in interest to the case of Messrs. Berteaux, was that of Duché Frères et Cie, who showed some of their famous Cashmere shawls. In the front of the case was a *fac simile* of a shawl purchased by the Empress of Russia, for 5,000 francs, and the fineness of this production was perfectly marvellous. Next to the white embroidered silk this shawl was the most coveted specimen of textile manufacture in the Exhibition. Many a lady, to get either of them, would resign her property in "La vierge aux poisons." Here then the Exhibition of 1865, showed a decided advance over that of 1862.

#### SECTION I.—MINING, QUARRYING, METALLURGICAL OPERATIONS, AND MINERAL PRODUCTS.

- 1 BERNARD Epéron. — Millstones. — (*Agricultural Hall, Kildare st.*)
- 2 GAILLARD, T. & Co. *La Ferté sous Jouarre*. — Millstones. — (*Agricultural Hall.*)
- 3 ROGER, SON, & Co. *La Ferté sous Jouarre*. — Millstones, burrblocks. — (*Agricultural Hall, Kildare st.*)
- 4 SOCIÉTÉ DES ARDOISIÈRES DE LA RICHELLE, *Rimogne, Ardennes*. — Slates from the Company's quarries in the Department of Ardennes.

#### SECTION II.—CHEMICAL AND PHARMACEUTICAL PROCESSES AND PRODUCTS GENERALLY.

- 5 BAUDISSON & HOUZEAU, *Reims (Marne)*. — Chemical products; animal black; photography on tissues.
- 6 DUBOSC, E. & Co. *Harre*. — Solid and liquid extracts of dyewoods, &c., &c., for dyeing and printing.
- 7 TISSIER & SON, *Conquet (Finistère)*. — Chemical products. In a *résumé* issued by this firm of the operations of their manufactory, it is stated that the price of pure iodine, which was in 1855 35 francs, and iodide of potassium 30 francs the kilogramme, they had reduced in price in 1862 to 18 and 12 francs respectively the kilo., and they sold in that year 7,000 kilogrammes at this price. In 1840 M. Tissier took out a patent for a new mode of treating marine plants for their chemical products, and recently Mr. Edward C. Stanford took out a patent in England and France for this process, which had been lost sight of, and reverted to the State. Ten years ago M. Tissier employed over 1,100 workmen, who received annually about 200,000 francs, and produced, without much effort and at little outlay, 1,500,000 to 2,000,000 kilogrammes of rough soda. From this was obtained, on the average, 250,000 kilogrammes of impure chloride of sodium, employed in the glass works and potteries. Two hundred thousand kilos. of chloride of potash, at 92 per cent., sold to the saltpetre and alum manufacturers; 90,000 kilos. of sulphate of potash, destined to be converted into carbonate; 15,000 kilos. of sulphate of soda; 4,000 kilos. of pure iodine; 4,000 kilos. of iodide of potassium; 700 of bromine; and 500 of bromide of potassium. There was also sold annually to agriculturists 12,000 hectolitres of soda residuum, which is found valuable as a manure.
- 8 ROCQUES & BOURGEOIS, *Ivry (Seine)*. — Chemical products.

#### SECTION III.—SUBSTANCES USED AS FOOD.

- 9 BECKER, J. H. D. *Bordeaux*. — French wines and brandies.
- 10 BELLOT & FOUCAUD, *Cognac (Charente)*. — Champagne wines.
- 11 BELTOS & FOMAND, *Cognac (Charente)*. — French brandy.
- 12 BONZEL, E. *Hanbourdin (Nord)*. — Chicory.
- 13 BOUGEREAU, G. *St. Florent près Saumur (Maine and Loire)*. — Sparkling Champagne wines.
- 14 BRUNET, J. *Ruedes Convalescents, 14-16 Marseilles (Bouches du-Rhône)*. — Wheat, flour, and semola.
- 15 CUZOR, SON & CO. *Bordeaux*. — Preserved fruit.
- 16 FLAMAND-LEZILLE, *Noyon (Oise)*. — Ground peas and pea flour.
- 17 GIBERT, G. *Reims (Marne)*. — Champagne wines.
- 18 GT, J. F. *Forges-les-Eaux (Seine-Inférieure)*. — Coffee roasted by hot air.
- 19 LUCK, J. *Haguenau (Bas Rhin)*. — Liqueur called "Crème de myrtilles."
- 20 MAYRARGUE BROTHERS, & Co. *Nice*. — Olive oil.
- 21 MENIER, E. J. *Paris*. — Chocolate.
- 22 MEUKOW, A. G. & Co. *Cognac (Charente)*. — French brandy.
- 23 ODEPH, A. *Luxeuil (Haute-Saône)*. — Opium; apparatus used in its extraction; poppy heads; extract from pomegranate tree.
- 24 PREVOT & Co. *Limoges*. — Torrified coffee.
- 25 PONSIN, BASSE, & Co. *Bordeaux*. — Wines; fruit; preserved meat, &c.
- 26 ROBIN, SON, *Ile d'Espagnac (Charente)*. — Torrified coffee.
- 27 UNION OF FRENCH WINE-GROWERS, *Dijon*. — Wines.
- 28 VIOLET, J. & Co. *Bordeaux*. — Imperial plums in glass bottles.
- 29 GROULT, SON, *Paris*. — Alimentary products.
- 30 DUFOUR & Co. *Bordeaux*. — Plums.
- 31 FAU, T. *Bordeaux*. — Plums.
- 32 DUCASSE & Co. *Cognac (Charente-Inférieure)*. — Brandy.
- 33 JOURDAN, BRIVE, SON, & Co. *Marseilles*. — Preserves; perfumery; liqueurs.
- 33A MÉRIC BROTHERS, *Perpignan and Madrid*. — Chocolate.

#### SECTION IV.—VEGETABLE AND ANIMAL SUBSTANCES USED IN MANUFACTURES.

- 34 AUGIER, A. *Marseilles*. — Oil for machinery and tools.

#### SECTION V. (C.)—CARRIAGES.

- 35 SARGENT, *Paris*. — Invalid carriage and chair. — (*In Carriage Court, No. 155A.*)

#### SECTION VII.—CIVIL ENGINEERING, ARCHITECTURAL AND BUILDING CONTRIVANCES.

- 36 GRENET, E. *Paris*. — Electric bells for domestic use.
- 37 MOSELNANN & Co. *Paris*. — Sanitary appliances. — (*Agricultural Hall, Kildare st.*)

#### SECTION VIII.—ORDNANCE, ARMOUR, &c.

- 38 TRONCHON, A. P. *Paris*. — Guns and fowling pieces; cartridges invented by the exhibitor.

#### SECTION IX.—AGRICULTURAL AND HORTICULTURAL MACHINES AND IMPLEMENTS.

- 39 MEYZOUNIAL BROTHERS, *Sarlat (Dordogne)*. — Boiler for farms, armies in the field, &c. — (*Agricultural Hall, Kildare st.*)

## SECTION X.—MUSICAL AND HOROLOGICAL INSTRUMENTS.

39A LEROY & SON, *Paris and London*.—Clocks and watches.

40 ALEXANDER, *Paris*.—Organs, harmoniums.

41 GEHRLING, O. *Paris*.—Musical instruments.

44 BUZIN, J. B. & Co. *Paris*.—Guide-accord; phonoptique, instruments for tuning pianos.

## SECTION XI.—COTTON.

45 THIERRY MIEG, *Mulhouse*.—Chintzes and cretonnes. London house, Caribian and Corbière.

## SECTION XII.—WOOLLEN AND WORSTED.

46 ARBECKY-COLLETTE, *Tourcoing (Nord)*.—Woollen yarn.

## SECTION XIII.—SILK AND VELVET.

In the French department, among the textile fabrics, Mr. J. Manning, of 102 and 103, Grafton-street, stood in the first rank. The magnificent collection of silks, velvets, laces, shawls, tissues, and mixed fabrics brought together by this gentleman proved so attractive a feature of the Exhibition that, in addition to the "service medal" awarded him, the Executive Committee did him the signal honour of addressing him a special letter of thanks for the great exertions and expense he incurred in bringing together so superb a display. The following are the names of the manufacturers whom Mr. Manning represented, all of whom received prize medals, and several of them most flattering and marked commendation from the jurors in their report:—

J. CHANEL, *Lyons*.—Filled shawls.

RODIER & Co. *Paris*.—Textile fabrics.

MAILLARD & Co. *Paris*.—Filled shawls.

AUGUSTE LEFEBURE & FILS, *a Bayeux (Calvados), and Paris*.—Finest laces.

47 BONNET, C. J. *Lyons*.—Plain glacé silks. 48 BRUNET-LECOMTE, *Lyons*.—Fancy silks. 49 BLACHE, ANDRÉ, & LEMARTRE, *Lyons*.—Velvets. Dublin house, J. Manning.

50 BERTHAUX, RADOU, & Co. *Paris*.—Silks, silk robes, &c.

51 COCHETEUX, *Templeuve*.—Silk and wool damask.

52 MILLION, J. N. & SERVIER, *Lyons*.—Rich plain coloured glacé silks. Dublin house, J. Manning.

53 PILLET MEUZÉ, *Tours*.—Silks for furniture.

55 BOUILLET J. B. *Paris*.—Silks; embroidery. Dublin house, Maison Meyer.

56 YEMENTIZ, *Lyons*.—Silks for furniture.

57 BRAUREPAIRE, E. *Paris*.—Silks for furniture.

58 JOSSEBAND & FAVROT, *Lyons*.—Grenadines and moumelines de soie. Dublin house, J. Manning.

## SECTION XIV.—MANUFACTURES FROM FLAX AND HEMP.

59 GUYNET, H. & Co. *Paris and Belfast*.—Printed linens.

60 LUMIGNY BROTHERS, *Cambray*.—Cambric. Dublin house, Maison Meyer.

## SECTION XV.—MIXED FABRICS, INCLUDING SHAWLS, AND EXCLUSIVE OF WORSTED GOODS.

61 CHANEL, J. *Lyons*.—Rich filled shawls. Dublin house, J. Manning.

64 TUVÉ & Co. *Paris*.—Tissues for millinery. Dublin house, Maison Meyer.

65 GAUSSEN, aîné, & Co. *Paris*.—(Calange L'honneur Françoise & Co., successors.) Cashmere shawls.

66 IMBA, *Paris*.—Tissue Indien, a new fabric.

67 LACASSAGNE, DESCHAMPS, SALAVILLE, & Co. *Paris*.—Cashmere shawls, &c.

88 RODIER, *Paris*.—Fancy tissues. Dublin house, J. Manning.

69 DUCHÉ BROS., & Co. *Paris*.—French cashmere, or woollen woven shawls.

70 FORTIER & MAILLARD, *Paris*.—Shawls. Dublin house, J. Manning.

## SECTION XVI.—LEATHER, &amp;c.

71 CHEILLEY, JNR. & Co. *Paris*.—Gloves; skins for manufacture of gloves.

72 LEGROS, aîné, *Paris*.—Leather and varnished skins.

73 POIROTTÉ, F. *Paris*.—Boots.

74 TREFOUSSE & Co. *Chaumont*.—Gloves.

## SECTION XVII.—PRINTING, &amp;c.

54 NISSOU, G. *Paris*.—Labels and tickets printed in chromo lithography.

## SECTION XIX.—TAPESTRY, LACE, AND EMBROIDERY, &amp;c.

62 DOGNIN & Co. *Paris*.—Shawls, lace, &c.

63 IMPERIAL MANUFACTORIES OF Gobelins and BEAUVAIS.—Tapestry.

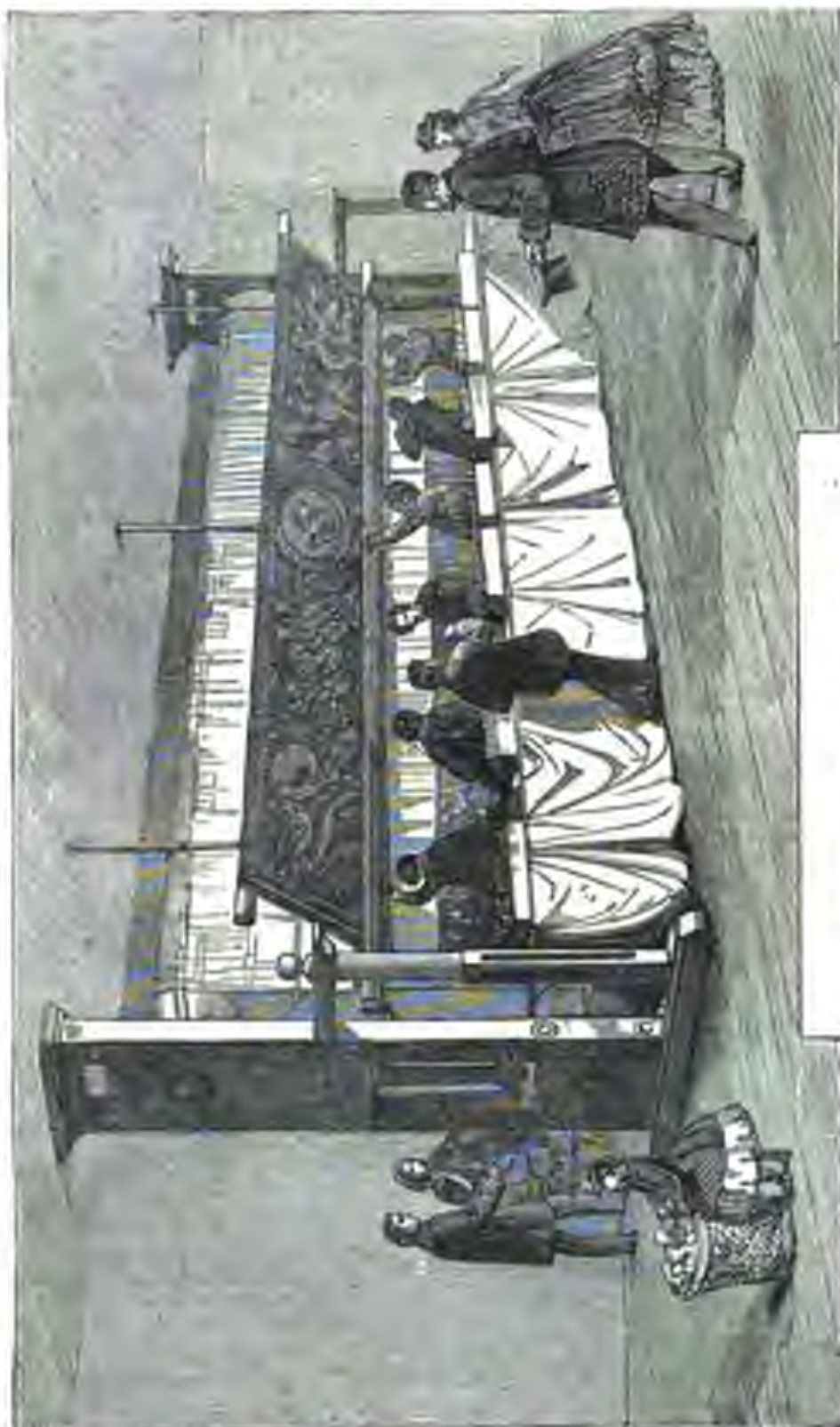
Although the specimens of Gobelines tapestry do not equal in importance those exhibited in London in 1862, yet, the moderate-sized imitations of the Boucher and Watteau school which they comprise, are fully as well adapted to exemplify the wonderful purity and truth of colouring for which this celebrated manufacture remains wholly unapproached. These were executed between 1861 and 1863; and they certainly exhibit no falling off as compared with many of the most famous works of former times. In fact, so careful is the artistic execution that those unacquainted with this class of art at first sight regard them as veritable paintings; and it is only on close examination that they are undeceived. The "Virgin," after Raphael is a work of great excellence. Durand's "Venus" is also a marvel, taking into account the material in which it is produced. The flower piece, from Beauvais, shows the effect of treatment on a different class of subject. Considering the great merit of these works, and their rarity, the Emperor of the French is entitled to the cordial thanks of the Committee of the Exhibition for the important contributions in this department.

The Imperial Manufactory of Gobelines includes two distinct works; that of historical tapestries or mural hangings, and that of carpets in fine wool, called Savonnerie, from the name of the house where they were first made.

These two textures appear to have been in use from the most remote period of time; they are mentioned in the most ancient documents transmitted to us by history and by monuments. The art of manufacturing them was imported from the East into Europe at a period difficult to determine, but which for France does not appear to be further back than the ninth century.

Tapestries present, like all interwoven cloths, a warp and a woof, but the woof alone appears both on the right side and on the wrong; the warp is wool; it may also be cotton, or even silk, or other matters used in tapestry; it is vertically held on two rollers called beams; the threads parallel to each other, and in the same level, are passed alternately over a staff called the *croisure* (cross-web), so that one half of the threads is, relatively to the worker, forward, and the other half backward. But the backward thread may be drawn forward by means of rings of pack thread, called *lices*, which surround them, and are held at the opposite side, on a fixed rod placed below the cross-web staff, at a little distance from the plane of the warp.

The cross-web staff for Gobelines is a glass tube from two to three inches in diameter.



Imperial Manufacture of Gobelin.

The wool is rolled on a little instrument, made of wood, called a *broche*, terminating in a point at one end, and which in tapestry is used instead of a shuttle.

To form the tissue, the worker takes a *broche* filled with wool or silk of the proper colour, fastens the extremity of the thread of the wool on the thread of the warp at the left of the space where the shades are to be placed, then, passing the left hand between the threads in front and back, he removes those that cover again

that same shade; his right hand passing between the same threads, takes from the left the *broche* to bring it back to the right; his left hand then seizing the warp, brings the back threads to the front, and the right hand darts the *broche* to the point from whence it came. This working of the *broche* backwards and forwards, in two opposite directions, forms what is technically called two *passages*, or one row.

The worker repeats successively these rows, one over

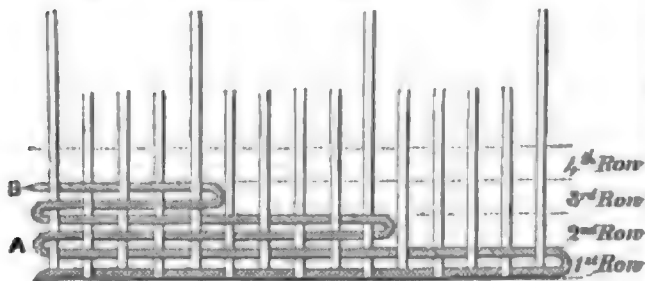
the other, according to the extent and outline of the space which the shades are to occupy with which the *broche* is filled. He takes a new *broche* for every new shade; cuts, stops, and loses at the wrong side of the tapestry, that is to say, the side on which he works, the thread of the preceding *broche*, if he is not to begin using it again near the same place.

At each row, he draws together with the pointed end of the *broche* the threads of the woof of the portion of the tissue already made. This first pressing together is not sufficient either to regulate the tissue, or to cover the warp exactly. The worker, after he has placed some rows one above the other, completes the compression by beating the woof with a heavy ivory comb, the teeth of which penetrate between the threads of the warp; the latter are thus completely hidden and brought to the same level.

The extent that a shade occupies determines the number of threads of warp in a passage or row; in a horizontal and even point the passage is stretched as much as possible to accelerate the work; it often happens that one passage contains only two or three threads of warp; the outlines of the design to be produced, the diverse accidents of colouring, the greater or less extent of light, of mezzotinto, &c., indicate the space to be given to the rows, as well as their number one above the other. They pass from light to brown, and from one tone to another, by colours running gradually, the one into the other, and disposed in *hachures*.

The outlines obliquely inclined by the construction of the threads of the warp, by the different lengths of the rows, are not in the greater number of cases, and if considered in a small part of their development, either right lines or curved, but always indented. This disposition, considering the fineness of the threads of the woof, does not in any way injure the general effect of the objects represented; it disappears in the details of shadow and of light of the extreme outlines, and by the work of the *hachure*.

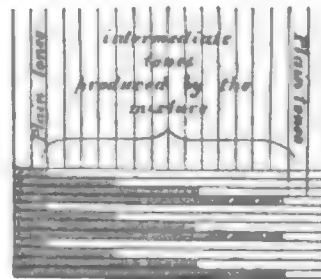
The *hachures* are employed to graduate the shades, and to prevent the Mosaic effect that would result from a simple juxtaposition of colours.



If we suppose that, in a given space, for example, of fifteen threads, a colour A forms a row from one end to the other, then, on ten threads, a second row, and lastly, on five threads, a third row; there will be a gradation in the colour employed, and the greater the number of rows the more intense the colour will be. If, now, we imagine a second colour coming from the point B, traversing equally the five threads, and filling the spaces, that is to say, making three rows where the first colour made one, two where the other made two rows, and one where it made three, there will be the same number of rows, four on fifteen threads, and these two colours thus employed will produce intermediate tints, more or less resembling either of the two, as it has more rows in the composition of the *hachure*.

The accompanying figure (see next column) represents the effect of the superposition of the *hachures*, and how it is possible with two colours to produce two and three intermediate tones. This disposition constitutes, in its simplicity, the ancient system of *hachures*, called "of one tone," or of one shade, a system very little used in the present day, and which is replaced by the work of *hachures*,

called of two tones, or of two shades crossing each other continually and giving as result a lightness of tone, transparency, and solidity to which it is impossible to arrive by any other combination.



The tapestry-maker, for the design of the objects to be represented, or the passage from one shade to another, is guided by a pattern traced in black on the warp, by the intervention of transparent paper on which he has previously chalked the drawing of the pattern.

This draft appears equally before and behind the warp, and consequently the worker can always see it whether he occupies his habitual place, or whether he goes round to the back to judge of the general effect.

The Savonnerie carpets differ essentially from the Gobelines tapestries both in the process of weaving and in the results; they belong to the class of velvets. The threads of wool, by their juxtaposition form the surface, and are each stopped by a double knot on two threads of the warp, which is in wool, and double; the warp combines both with the threads of the velvet surface and with a woof and a *duite*, of which no part appears outside; the carpet maker sees the right side of the carpet and not the wrong, as in Gobelines tapestry. The warp is held vertically, as in the high warp looms for tapestry, and the loom is in the same form, but much larger.

63A BRAQUENIE BROS. Aubusson (Creuse).—Tapestry for hangings.

74A FLIPO, J. F. Tourcoing (Nord).—Reps for hangings, curtains, damask table cloths, silken and woollen stuffs.

75 BOUSSART-FLOREN, Tourcoing.—Curtains; table-covers.

75A FERGUSON, FLS, 40 Rue des Jeuneurs, Paris.—Lace.

76 ARNAUD-GAIDAN, Nîmes.—Tapestry, portières, &c. London house, Carlhian and Corbière.

77 DELCAMPRE, A. Chantilly.—Lace. Dublin house, Maison Meyer.

78 GROS, S. & SON, Lyons and Dublin.—Embroidered vestments.

79 LAFOND & DUPONT, Paris.—Tapestry and designs; reps; damask; table cloths, &c.

80 LEFEBURE & SON, Paris.—Lace. Dublin house, J. Manning.

81 MORCEAU, Paris.—Tapestry, portières, &c.

82 VASON, Abbeville.—Carpets, tapestry, &c.

83 WALMEZ, DUBOUX, & DAGER, Paris.—Tapestry and table-covers.

## SECTION XX.—ARTICLES OF CLOTHING.

84 MEYER, M<sup>me</sup>. Paris and Dublin.—French corsets.

85 POIROTTÉ, M<sup>me</sup>. Paris.—Corsets.

86 BAGRIOT, F. A. Paris.—Buttons for liveries, military and other uniforms, sporting suits, &c.

## SECTION XXII.—HARDWARE.

87 DUPONT, PH. Cherbourg.—Metal varnish; coffee and pepper mills.

88 TROCARD, T. Paris.—Improved coffee-pot.





Barbeaht's Fountain in Exhibition Gardens (No. 100. - France).





**SECTION XXIII.—WORKING IN PRECIOUS METALS AND IN THEIR IMITATIONS; JEWELLERY AND ALL ARTICLES OF VERTU AND LUXURY NOT INCLUDED IN OTHER CLASSES.**

**89 BLOT & DROUARD, Paris.**—Ornamental articles in zinc, imitating bronze. London house, Carlhian and Corbière.

**90 CARLHIAN & CORBIÈRE, Paris and London.**—Lamps; clocks; bronzes, &c.

**91 HOTTOT, Paris.**—Ornamental articles in zinc, imitating bronze. London house, Carlhian and Corbière.

**92 MIROY BROS. Paris and London.**—Bronzes.

**94 SUTTON & CHARBONNE, Paris.**—Clocks; gilt, bronze, and marble; compo-bronze statuettes, &c.

**95 THENARD, F. Paris.**—Plated and oxydized bronze medallion, representing Lord Palmerston.

**96 SUTTON & CO. Paris.**—Bronzes.

**97 BOY, Paris.**—Bronzes.

**98 DUFRE, Paris.**—Bronzes. Dublin house, T. Brunker.

**99 BARBÉDIENNE, F. Paris.**—Bronzes.

**100 BARBEZAT, Val d'Anc.**—Cast iron statues, vases, &c.; two fountains in Exhibition garden. Of the larger of these we give an illustration. London house, Carlhian and Corbière.

For the production of tasteful sculptured fountains the French have been celebrated since before the days of Jean Goujon; and they are as far in advance of us now as ever. To say nothing of the magnificent fountains of Paris and Versailles, in what provincial town of France would they tolerate mere waterspouts such as those of Trafalgar-square and the Crystal Palace? The fountain of which we give an illustration is erected beside a smaller specimen by the same firm, in the prettily laid out grounds of the Exhibition, and though it may appear to untravelling eyes something quite unusual and ornate, is only one of a kind that the French manufacture by the score. In design it is *Renaissance*, like nearly all French fountains, and its figures and ornaments are drawn from classical mythology. The style, certainly, admits of that freedom in the introduction of allegorical figures and conventional emblems, without which it is difficult to understand what meanings and associations or decorative interest could be given to so artificial a thing as a fountain. Compared with the licentious picturesqueness of many French fountains, however, this is comparatively simple and symmetrical. Round the stem, beneath the central basin, are an aged and a youthful river god, and two fluvial goddesses with the usual aquatic emblems; and round the stem above, backed against it, are four genii joining hands.

Masks, garlands, and dolphins, water plants, and mouldings, complete the ornamentation; and the jets of water are arranged to spring from the top of the stem, or the figures and masks round the basins. The figures are modelled by a sculptor of great ability, M. Moreau. But what is, perhaps, more noteworthy in regard to this fountain, is the fact that it is of cast iron, a material which, although it will not acquire the rich "patina" of bronze, will, if kept well bronzed, answer every purpose of the alloy, and admits of a very great reduction in the price. Such large and artistic iron castings are a remarkable and unrivalled feature in French manufactures. The agents, Messrs. Carlhian and Corbière, of Cannon street, London, exhibit in the apex of the nave a collection of iron castings of large statues, groups, pedestals, and ornaments of various kinds from the foundries of Messrs. Barbezat and Co.—the same who cast the fountain—and the clearness and finish of these castings are extraordinary. On a slight inspection they would hardly be detected from real bronze. It is difficult to believe that they have not been laboriously finished by hand after leaving the mould, though this is, of course, almost impossible. Messrs. Barbezat & Co., are the largest cast-iron founders in

France. At their foundry, at Val d'Osne, they employ, it is said, upwards of 800 men.—*Illustrated News*.

**SECTION XXV.—CERAMIC MANUFACTURES.**

**101 IMPERIAL MANUFACTORY OF SÈVRES.**—Collection of china and porcelain. (For illustrations see p. 406.)

The French are, strange to say, proportionately more poorly represented in the fine art department of the Exhibition than any other foreign nation. In the department of art-manufactures and industry, on the contrary, they make the best display of any but British contributors. In the middle of their prominent and advantageous position are effectively disposed the objects sent by the Emperor from the Imperial Manufactories of Sèvres china and Gobelins tapestry; and these form the most beautiful and interesting portion of the French collections. Among the Sèvres china there are examples which—although we may be fairly considered to be surpassing the French in ceramics generally (and also glass manufactures)—still remain hardly rivalled. From several almost matchless vases we have selected two of the largest size, and the most artistic for illustration. One of these, with ormolu handles, called a "carafe" by the French, is Etruscan in form, and its decorative paintings on a violet ground are *Renaissance* in style, consisting of a figure of "Spring," with natural flowers and conventionalised foliage. The price is about £160. The other vase (one of a pair) is of a form called "Bertinn" in France, but that is really of Oriental origin, as its imitation "celadon," or pale sea-green ground, and, to a certain extent, the character of the ornamentation. The last consists of wild ducks, natural firecons, and hops. But the peculiarity of this decoration is that it is formed with applied white paste, in slight relief. There is, besides, on the Sèvres stand, a large fountain, with a group of two boys in imitation majolica; together with a magnificent pair of Mansard vases, decorated on a deep green ground, with figures and ornaments in blue, gold, and bronze; a fine Coupe d'Amboise, encircled with foliage and amorini in high relief; a Coupe d'Urbino, with delicate paintings on a white ground; imitations of Palissy ware, and old Sèvres, not to speak of dishes, plates, and services innumerable.

**SECTION XXVI.—DECORATION, FURNITURE, AND UPHOLSTERY, &c.**

**102 FOURDINOIS, Paris.**—Fancy furniture.

**103 DIEHL, Paris.**—Fancy furniture.

**105 GERSON & WEDDER, Paris.**—Fancy furniture and wood carvings.

**106 LEGLAS-MAURICE, Nantes.**—Carved port-armé furniture.

The cabinet, or imitation antique "buffet," is one of the very finest examples of decorative furniture in the Exhibition. It was designed as a receptacle for arms, or armoury, or, as the French have it, a "porte-armes." The glass cases of the upper portion, as well as serving to preserve from rust and dust, guns, swords, and other weapons that may be placed within, would of course allow them to be seen, and in being seen the highly decorative effect of a group of choice arms would contribute greatly to the richness of the ensemble. The plain portion of this piece is oak; the carved details are in walnut. The style is *Renaissance*, and we must express our warm admiration of the harmonious design, and especially of the way in which the principles of continuity and repetition have been observed throughout. The carving is bold where a supporting and structural member had to be emphasized, and exquisitely delicate where only a flat panel had to be ornamented. It deserves to be instanced as a model of skilled workmanship as well as design. It has already figured in the Exhibition held at Bayonne some time since, and was exhibited by Messrs. Carlhian and Corbière, as agents for the manufacturer.

SECTION XXVII.—MANUFACTURES IN MINERAL SUBSTANCES USED FOR BUILDING OR DECORATION.

104 CHAMFONCEVILLE, *Metz*.—Painted bas reliefs and statues in terra cotta.

107 VILLERME, *Paris*.—Alabaster garniture. Carlhian and Corbière, London.

SECTION XXVIII.—MANUFACTURES FROM ANIMAL AND VEGETABLE SUBSTANCES.

109 FAUVELLE DELERBIERE & SONS, *Paris*.—India rubber and tortoise-shell combs.

109 HODRA, A. *Marseille*.—Wax candles.

SECTION XXX.—PHOTOGRAPHY.

110 VERGNET L'ABBE DE, *Carcassonne*.—Photography applied to numismatics.



Sèvres Vases.

## KINGDOM OF ITALY.

## ROYAL ITALIAN COMMISSION, TURIN,

INSTITUTED BY THE MINISTER OF AGRICULTURE, INDUSTRY, AND COMMERCE,

26th DECEMBER, 1864:—

MATTEUCCI, Comm. Prof. CARLO, Senator, *President*.AGODINO, Chev. Avv. PIO, Director of the City Fine Arts Gallery, *Vice-President*.

AREZZO DESPUCHES, Chev. CORRADO, Baron of Donna-fugata, Memb. Italian Parl.

CURIONI, Comm. GIULIO, Sec. of the Royal Lombard Inst. of Science, Letters, and Art.

DEVINCENZI, Comm. GIUSEPPE, Memb. of the It. Parl., Director of the Royal Italian Industrial Museum at Turin.

ELLIOT, Hon. HENRY, Envoy Extraordinary and Minister Plenipotentiary of H.M. the Queen of Great Britain and Ireland at the Court of H.M. the King of Italy.

JERVIS, Chev. W. P., Curator of the Royal Industrial Museum, Turin, *Secretary*.

MANNA, Comm. Prof. GIOVANNI, Senator.

REY, Chev. LUIGI, Manufacturer.

TASCA, Chev. Dr. GIOVANNI BATTISTA, President of the Chamber of Commerce and Arts.

Royal Italian Commissioner in Dublin—AREZZO DESPUCHES, CORRADO, Baron of Donna-fugata, Memb. Italian Parl. (now a Senator).

Commissary Inspector of the Italian Department—MARANI, Chev. Prof. AUGUSTUS CESARE, Italian Consul in Dublin.

There were also twenty-one important Sub-Committees appointed in different towns of the Kingdom, which rendered essential service, but for these we cannot find room in detail, owing to the extreme length of the Italian Catalogue.

[NOTE.—In publishing the Special Italian Catalogue the Royal Italian Commissioners state they have had a double end in view; while offering to the intelligent visitor to the Exhibition a guide containing sufficient description of the most important and novel objects to render it more interesting than a simple inventory, such as catalogues generally are, they felt that their first duty was essentially to promote the development of commercial relations between Italy and other countries, affording all possible facilities to merchants, and inserting the prices of the articles sent, a large class of which must be considered as samples, suggested as suited for establishing increased trade with Italy.

The wines, oils, preserved meats, dried fruits; the raw cotton, silks, straw work, and gloves, no less than the cameos, coral and lava work, ornamental articles in serpentine, terra cotta manufactures, carved furniture, brass musical instruments, and other objects, might all be more largely exported with advantage. Although the number of contributors is small, great care was taken in selecting them to admit only such as would do honour to the country, and Jurors of former International Exhibitions will see with pleasure the reappearance of a large proportion of those to whom they have already awarded prizes.

The Italian department, however incomplete it may be, from difficulties which it would be useless to enumerate here, has a special importance and interest, as marking a progress in the economic condition of the Kingdom, having been got up, without pecuniary aid from the Government, by the force of individual efforts, seconded by the principal Chambers of Commerce and Municipal authorities. The enlightened cooperation afforded by the Sub-Committees, especially those of Milan, Florence, and Naples, have tended greatly to promote the success of the undertaking. If this Court be found wanting in the richness of decoration visible in other parts of the building, the imperfection must be attributed to the causes specified; but, such as it is, it will prove the willingness of Italians to contribute to the Dublin International Exhibition.]

**DISTRIBUTION OF THE ITALIAN EXHIBITORS BY PROVINCES,**  
SHOWING THE RELATIVE NUMBER IN EACH CLASS, AND SUCH AS OBTAINED PRIZES AT NATIONAL OR INTERNATIONAL EXHIBITIONS.

PROVINCE	Number of Exhibitors at Dublin, 1865							Paris, 1855	Florence 1861	London, 1863		Turin, 1864	
	Inscribed in the Catalogue in their own names				Collective Exhibitors	Medals	Honour- able Mention					Native Cotton Exhib.	Native Wine Exhib.
	Raw Products	Industry	Fine Arts	Total									
Milan, . . . . .	4	34	37	75	—	17	11	4	13	7	6	—	—
Turin, . . . . .	14	28	25	65	4	10	10	1	6	2	1	—	—
Naples, . . . . .	12	22	19	53	2	8	9	—	2	11	1	1	—
Florence, . . . . .	10	13	6	29	1	9	6	1	9	6	1	—	—
Catania, . . . . .	26	5	—	29	1	6	1	—	11	6	1	1	4
Genoa, . . . . .	11	6	—	17	1	4	3	—	6	3	4	—	1
Lucca, . . . . .	8	4	2	14	17	2	1	—	3	1	2	—	1
Terra di Bari, . . . . .	15	—	—	15	3	0	1	—	1	2	—	—	2
Bologna, . . . . .	12	—	2	14	—	2	—	—	2	3	2	—	—
Palermo, . . . . .	7	2	3	12	2	—	3	—	2	—	—	3	—
Parma, . . . . .	7	5	—	12	—	5	2	—	1	—	1	—	1
Sienna, . . . . .	8	3	—	11	1	1	—	—	6	2	1	1	—
Reggio d'Emilia, . . . . .	1	5	3	9	—	3	—	—	1	—	1	—	—
Modena, . . . . .	6	2	—	8	—	5	1	—	3	1	1	—	—
Pisa, . . . . .	7	—	1	8	—	4	3	—	5	3	1	—	—
Cuneo, . . . . .	5	3	—	6	7	—	2	—	5	2	—	—	2
Capitanata, . . . . .	6	—	—	6	—	—	1	—	—	1	2	—	—
Leghorn, . . . . .	4	1	—	5	1	2	—	—	—	—	—	—	2
Macerata, . . . . .	4	1	—	5	1	1	—	—	1	—	—	—	—
Cagliari, . . . . .	5	—	—	5	4	—	—	—	—	—	—	1	1
Brescia, . . . . .	2	2	—	4	—	3	1	—	2	—	2	—	—
Umbria, . . . . .	—	2	1	3	—	2	1	—	2	2	—	—	—
Como, . . . . .	2	1	—	3	—	—	1	—	1	1	—	—	—
Calabria Citeriore, . . . . .	3	—	—	3	—	—	1	—	—	—	—	1	—
Rome, . . . . .	—	1	1	2	5	1	—	1	—	1	—	—	—
Calabria Ulteriore, I. . . . .	2	—	—	2	2	1	1	—	—	1	2	—	—
Alexandria, . . . . .	1	1	—	2	9	1	1	—	2	2	2	—	6
Arezzo, . . . . .	1	1	—	2	—	—	—	—	—	—	—	—	—
Abruzzo Citeriore, . . . . .	2	—	—	2	—	—	1	—	—	—	—	—	—
Messina, . . . . .	1	1	—	2	1	1	1	—	1	—	—	—	1
Noto, . . . . .	2	—	—	2	4	1	—	—	1	—	—	—	1
Grosseto, . . . . .	2	—	—	2	2	—	1	—	—	—	—	3	1
Trapani, . . . . .	1	1	—	2	1	—	—	—	1	—	1	—	—
Bergamo, . . . . .	—	—	1	1	—	—	—	—	1	—	1	—	—
Girgenti, . . . . .	1	—	—	1	—	—	—	—	—	—	—	—	—
Londini, . . . . .	1	—	—	1	—	1	—	—	1	—	—	—	—
Cremona, . . . . .	1	—	—	1	—	—	—	—	—	—	—	—	—
Pavia, . . . . .	—	1	—	1	3	—	—	—	2	1	—	—	2
Pesaro, . . . . .	—	1	—	1	—	1	—	—	—	—	1	—	—
Placenza, . . . . .	—	1	—	1	2	1	—	—	—	—	—	—	1
Principato Citeriore, . . . . .	—	1	—	1	—	6	1	—	—	—	—	6	—
Novara, . . . . .	—	1	—	1	—	1	—	—	1	1	—	—	—
Caltanissetta, . . . . .	—	—	—	—	5	—	—	—	—	—	—	8	—
Basilicata, . . . . .	—	—	—	—	1	—	—	—	—	—	—	1	—
Principato Ulteriore, . . . . .	—	—	—	—	1	—	—	—	—	—	—	1	—
Abruzzo Ulteriore, I. . . . .	—	—	—	—	2	—	—	—	—	—	—	—	1
Ancona, . . . . .	—	—	—	—	1	—	—	—	1	—	—	—	1
Ravenna, . . . . .	—	—	—	—	2	—	—	—	—	—	—	—	1
Sassari, . . . . .	—	—	—	—	3	—	—	—	—	—	—	2	—
	192	147	101	440	92	99	64	7	93	51	34	34	29

**SECTION I.—MINING, QUARRYING, METAL-  
LURGICAL OPERATIONS, AND MINING  
PRODUCTS.**

[Number of Exhibitors, 19. Of these 3 obtained medals at the Italian Exhibition at Florence in 1861; 3 received medals and 1 an honourable mention at the London International Exhibition in 1862, and at the Dublin International Exhibition, 1865, 4 received medals and 6 honourable mentions.]

**1 BARBAGALLO, SALVADORE, Catania.**—1. Groundsublimed sulphur from the exhibitor's manufactory at S. Giorgio. M., Florence, 1861; M., Dublin, 1865.

**2 CORBI-ZOCCHI, CARLO, Sienna.**—Sienna earths. M. Florence, 1861; H. M., London, 1862.

The sale of these earths, which come from the exhibitor's mines on the Monte Amiata, and are prepared and burnt by him at Sienna, has fallen off considerably since the American civil war, as the greater part of the exportation used to be to the United States, France,

and Holland, only a small quantity being sent to England.

**3 DIRECTORS OF THE MONT CENIS SUB-ALPINE RAILWAY TUNNEL, 2, via S. Secondo, Turin.**

Series of specimens of the rock met with in the Mont-Cenis tunnel, taken at equal distances apart, both on the Bardonnèche and Modane sides, together with several special specimens from different intermediate points, serving to illustrate the internal geological structure of the Alps. M., Dublin, 1865.

Table showing the progress of the work up to 28th June, 1865:—

Year	Bardonnèche, or Italian entrance Feet	Modane, or French entrance Feet	Total Feet
1857	89	35	124
1858	845	663	1,508
1859	775	436	1,211
1860	669	458	1,127
1861	558	633	1,191
1862	1,247	797	2,044
1863	1,397	1,234	2,631
1864	2,037	1,532	3,569
1865, to May 15th,	918	792	1,709
<b>Totals,</b>	<b>8,535</b>	<b>6,579</b>	<b>15,114</b>
<b>Total length of the tunnel, .</b>			<b>40,093 feet</b>
<b>Length completed, June 28th, 1865,</b>			<b>15,610 "</b>
<b>Length still to be bored, same date,</b>			<b>24,482 "</b>

The machines were placed on the Italian side in 1861, and on the French side in 1863.

It consists of two gradients of  $\frac{1}{10000}$  and  $\frac{1}{11110}$  on the Italian and French sides respectively; the absolute heights are—French entrance, 3,944 feet; Italian entrance, 4,378 feet; height of Mont Cenis above the tunnel, 9,669 feet.

In the year 1864, which may be taken as a mean, both from the skill of the workmen and the present worn-out condition of the machinery, 3,569 feet were bored. If matters were to proceed at this rate, seven years would be necessary to complete the tunnel, but practical men consider that many difficulties now existing can be overcome. The greater part of the miners are Piedmontese. On the Modane side of the mountain sandstone or quartzite has been met with of such hardness that even with the aid of the machinery it is impossible to advance more than twenty inches in twenty-four hours; but even this is a great achievement, since by hand it would have been difficult to bore more than nine inches in the same time. Geologists had foreseen the existence of this rock in the tunnel, and determined its stratification and position, presuming its thickness to be from 900 to 1,250 feet. Previous to meeting with the quartzite about thirteen feet were bored daily. On the Bardonnèche side geologists consider that no harder rock than the present will be met with; on the contrary, there is every reason to suppose that it may become softer.

Judging from the constant improvements which are made in the machinery and the experience acquired, it is reasonable to hope that the tunnel may be opened at the close of 1870.—**GER. SOMMEILLER**, Director.

The project for tunnelling the Alps was presented to the Piedmontese Parliament, in the year 1856, by Messrs. Grandis, Graton, Ronco, and Sommeiller, civil engineers; and, after due examination by the Chambers, was approved of in an Act passed on the 15th August of the same year. The direction of the works was placed in the hands of MM. Grandis, Graton, and Sommeiller, and, the financial branch entrusted to an inspector appointed by Government to watch over the interests of the State, which were further guaranteed by the stipulation, that a yearly report of the progress of the works, should be submitted to the House.

The proposed tunnel was to unite the Savoy provinces of the Kingdom with the cisalpine ones, the entrances being respectively in the vicinity of the little villages of Fourneaux, and Bardonnèche, both situated at a considerable elevation—the former, indeed, near the high road from Chambéry to Turin, and one mile and a half from Modane; but the latter, with its population of 1,300 shepherds, who abandon their houses in Summer-time to tend their flocks on the rugged slopes of the Alps, being completely out of the way of the rest of the world—and neither of them presenting any better accommodation for the engineers and workmen than the cabins in which the shepherds were accustomed to Winter in common with their flocks.

The triangulation of the Mont Frejus, and of the two slopes, was undertaken by MM. Borelli and Copello, in 1857 and 1858, after having run two preliminary lines across the mountains from north to south, one of which came out too high above Bardonnèche, the other below it, enabling these engineers to draw their third line, which succeeded admirably, and was that adopted definitely for the axis of the tunnel. The inclemency of the Winter months and the high winds on the Col de Frejus rendered a suspension of this work necessary; but meanwhile an observatory was established on an eminence situated on the prolongation of the axis decided on for the future direction of the tunnel, and the trigonometrical points of the Royal Engineer Staff were visited and utilized for future operations. Twenty-one stations were established on the mountain descending towards Bardonnèche and Modane, from which were made 28 triangles, and the 84 angles observed were each repeated 10 times at least—the principal ones as many as sixty. A third observatory was now placed at the summit of the mountain, and M. Mondino proceeded to level the whole line afresh, aided by the three observatory stations at his disposition, and from whence he was furnished with all the necessary intermediate stations in line from end to end.

The distance from the central observatory of the Grand Vallon to the terminal ones is very nearly equal, and from it the signal at the north end of the axis of the tunnel is perfectly visible on a lofty part of the mountain on the opposite slope to that on which the tunnel commences. Southwards an intermediate station on the crest of Mont Banda covers the extreme observatory without depression of the instrument, thus insuring the utmost

accuracy; and, as the theodolite used was of extraordinary precision, and the observations repeated by different persons, the utmost error in turning the instrument round through  $180^\circ$  may be assumed as a difference of  $10''$ , which would produce a total linear difference of 17 inches on either side of the tunnel—a quantity which may be absolutely disregarded. Lastly, observations were made at the intermediate points, so as to be able to erect observatories at the very entrance to the tunnel on either side, from which to work. It may be mentioned that this was no easy task, however simple it may appear to a stranger who knew that it was based upon a line of the staff survey immediately depending upon one of the first order; in fact the winds and clouds in continual alternation, interrupted the prosecution of the work, and necessitated the climbing up of these craggy and pathless eminences, day after day, for 3,000 feet from the nearest habitation, often to return again without having accomplished anything.

The tunnel itself was being proceeded with by the ordinary plan of hand-boring even before the levels were ascertained with mathematical precision, as it was clear that any little divergence could be amply compensated for in so long a line. A vast building was erected at Bardonnèche to contain the machinery for supplying compressed air to the boring apparatus, and a covered canal, with a section of 10 cubic feet and 2 miles long was made to convey the water to the compressors, passing along the mountain sides over and under the torrents. This canal was supplied with a basin where the impurities and vegetable matters subside, or are retained by a grating, and at the extremity communicates with a compression reservoir, from whence the water reaches, through a column 85 feet in height, into the compressors. There is also a vaulted reservoir capable of holding 14,120 cubic feet of water which keeps up the tension in the recipients of compressed air with which it is connected, 164 feet below, uniformly at 6 atmospheres. All the necessary fitting shops, smithies, and stores were erected, and a spacious building containing 96 rooms for the accommodation of the workmen. Similar arrangements were made at Modane, except that there the section of the canal was 63 square feet, and an automatic inclined plane of 348 feet in length was made to communicate between the valley and the entrance of the tunnel.

The machinery for compressing the air and that for boring was made in Belgium at the Serning Works, near Liege; and at the beginning of the year 1859 the first portion was already erected at Bardonnèche, when the war broke out, and put a stop to everything. In November, 1860, however, the perforators were at work, and eight months later the innumerable technical difficulties of erection and application being overcome, the frame-work supporting the perforators was in order, and since then has worked with increasing precision.

The air-compressing machinery at Bardonnèche consists of a series of columns, 85 feet high, provided at the base with an entrance and an exit valve, these being connected by levers with a horizontal axis moved by compressed air. The water, rushing down the columns from the reservoir at the top, is liberated at given intervals by the opening of the valves, and finds its way into a corresponding cylindrical air receiver, of the capacity of 603 cubic feet, in which, at each stroke of the water, the air is imprisoned by the very column which produces the compression.

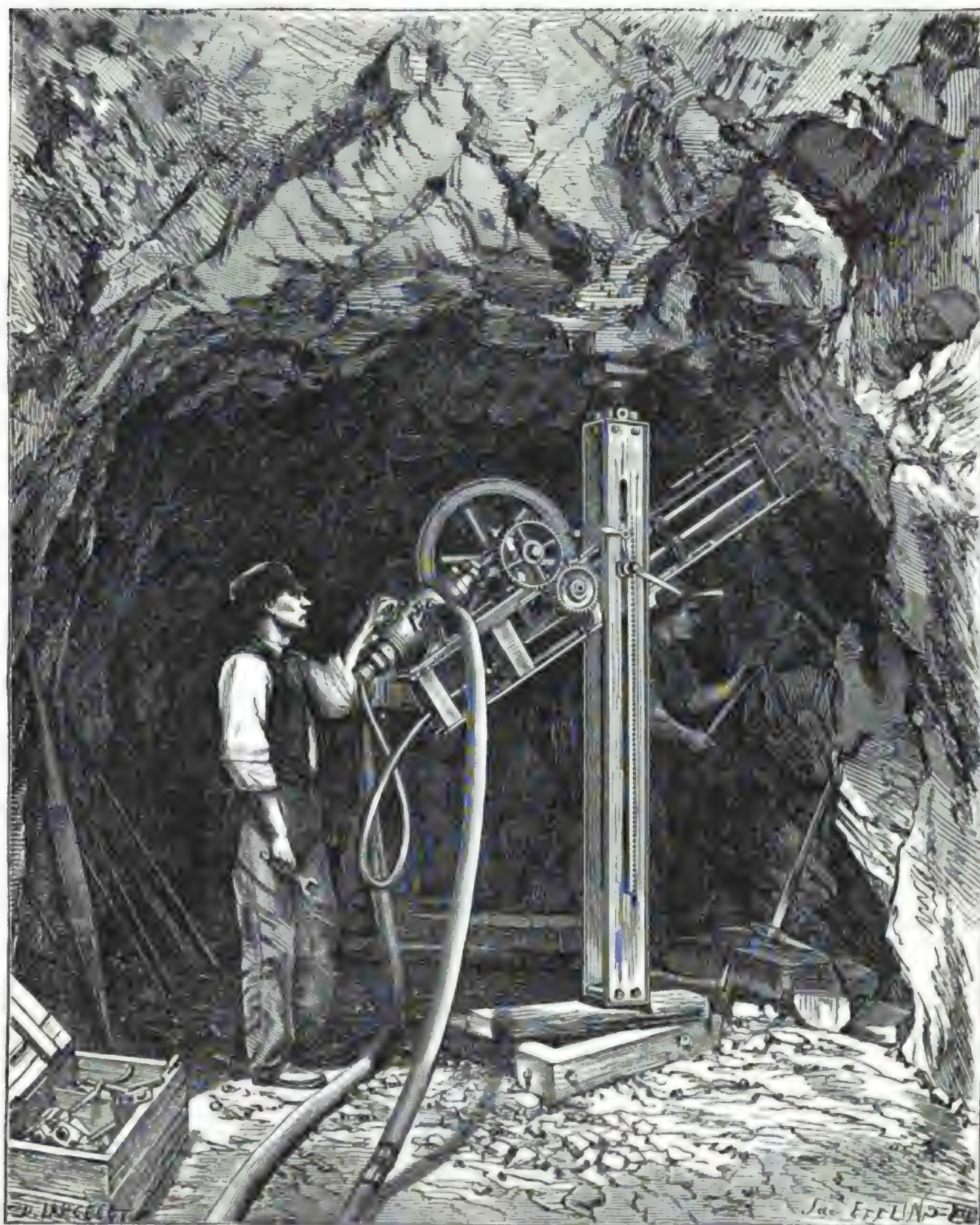
The most important point to be noticed in this machinery is the multiplication of the compressing columns and the air receivers, which may either be all worked together or each separately, or finally any particular one may be detached should an accident occur to put it out of order. The air receivers communicate with a common receiver of compressed air, from whence an iron tube, 8 inches internal diameter, leads directly into the tunnel and terminates at the boring machinery. During the course of the year 1862 the production of compressed air at 6 atmospheres was  $49\frac{1}{2}$  millions cubic feet.

The tunnel may be divided into three parts:—First, that which is foremost, and where the compressed air machinery is at work forming a preparatory tunnel of small section—of 11 feet 4 inches in width, by 7 feet 10 inches in height—and succeeded by the portion which is enlarged by the miners to the definite dimension by the ordinary process of boring. Here the road-makers are laying down the tramway, and placing in a trench prepared under it the several pipes for the compressed air, water, and gas—all which are thus safe from injury and completely out of the way. The timberers are simultaneously busy in propping up the vault and sides; and the masons bring up the rear, rivetting the whole tunnel, from whence to the entrance is the completed portion of the tunnel.

Nine or ten perforating tools are arranged at the front part of the boring apparatus, some pointing straight forward, the others in diagonal and transverse directions. Each perforator is provided with two flexible tubes, one for the compressed air, the other for supplying the water which is projected into the hole to keep it free from dust. The men employed at the machinery consist of 2 miners, 4 mechanics, 8 men to work the borers, 9 workmen to move the machinery, and regulate the air and water supply, 5 boys for oiling the bearings and other accessory work, 8 labourers connected with the boring part of the machinery, 2 labourers to communicate with the fitting shop and smithy, and 1 captain; total, 39 persons.







Boring Machinery.—Mont Cenis Tunnel.

As the tools work quite independently of one another, each makes as many holes as he can; the greater number being towards the central part. When about 80 holes of 29 to 32 inches have been made, the air pipes are disconnected, and the machinery is removed back behind a trap safety door; the central holes are charged with gunpowder and fired, and then the lateral ones. The force with which the tools are driven against the rock by the compressed air is 200 pounds, and by suitable gearing they are made to revolve on their axis. When the rock is of ordinary hardness the tool turns 57,500 times in order to make 8 holes of 32 inches in depth, giving a blow at each turn, as the work of a gang of men. The whole current of compressed air is now let loose against the fore part of the tunnel, which is a great relief to the miners, in at once purifying the air of the dense smoke which lodges there. The clearers at once take their turn, and proceed to remove all the rock which has been blasted in the little waggons, as in ordinary mining operations. A fresh length of rail is laid down if the advance of the work be sufficient to permit of it, and then the boring machine is moved once more to the front to repeat the operation over again. This time, however, a new gang of men come in as the others have finished for the day.

Regarding the length of time employed in the several operations—supposing any period to be divided into 8 equal parts—it was found by a calculation made in 1861, that  $4\frac{1}{2}$  of such parts were occupied in boring with the machinery, 2 in firing the mines, and  $1\frac{1}{2}$  in clearing away the rock which had been fired, and preparing for commencing a fresh operation.

It was found impossible at the Modane side of the mountain to obtain a fall of water like that at the Italian entrance. The torrent Chairmaix, indeed, allowed of sufficient fall, but the supply was not perennial. A constant fall of 20 feet was procured from the Arc, which supplemented the former in Summer months, and was pumped up to the proper height of 85 feet. Since then, however, a new arrangement of force pumps has been introduced for compressing the air which has been found to answer very well.

**4 ITALIAN COAL COMPANY, LIMITED, Frederick place, Old Jewry, London,** represented by William Miller, Leghorn. Lignite from Lama mine, in Val di Cecina, near Pomarance, Pisa. This basin was discovered at the beginning of the year 1864. The mine is already able to yield thirty tons of lignite per diem.

**5 LANCIA, FEDERICO, Duke of Brolo, Palermo.** Crystallized native sulphur on marl, from the Solfatara of Arcara (*Caltanissetta*). Stalactitical native sulphur from the same locality. Sulphur in cakes, price 6s. per cwt. Native sulphur on lava, from Etna. Rock salt in violet cubic crystals, from Castrogiovanni (*Caltanissetta*). H. M. Dublin, 1865.

**6 MASCOLO, GENNAKO, Ponte della Maddalena, Naples.**—Cemented, fagotted, and cast steel; best cast steel. H. M., Dublin, 1865.

**7 MORET, PEDRONE, and Co., 11, via di Brera, Milan, and Lecco (Como).** Lead ores from Crandola and Bindo, near Introbio (*Como*). Copper ores from Vinogno, near Introbio (*Como*). Fondra, near Piazza (*Bergamo*), and Malonno, near Edolo (*Bergamo*). Copper and nickel ore from Antronapiano, near Domodossola (*Novara*). Isiglio, near Vistrorio (*Turin*), and Mezenile, near Ceres (*Turin*). Copper ores from Valprato, near Pont (*Turin*). Copper ores from Valtorta, near Piazza (*Bergamo*). Ores of Copper and lead, from Tavagnasco, near Ivrea (*Turin*). H. M. Dublin, 1865.

**8 NOVI, CHAS. Prof. GIUSEPPE, 8 Mergellina, Naples.**—Samples of earths, clays, marls, ochres, sand, for the manufacture of alum, colours, stoves and enamels, for moulding bronze and iron, for crucibles for casting steel. H. M., Dublin, 1865.

**9 PAGANINI, GIOVANNI BATTISTA, Genoa.**—Oval slab of calcareous serpentine or opicalcite, from Carro, near Mataranz. Rectangular slab of serpentine from the same locality. From newly opened quarries situated half way between Spezia and Chiavari, on the coast of Liguria.

**10 PERATONER, ANTONIO & SONS, Catania.**—Sulphur. Price 5s. 3d. per cwt.

**11 ROMAGNA SULPHUR MINING COMPANY, Bologna.**—Refined sulphur and ground sulphur. M., Florence, 1861; M., London, 1862; M., Dublin, 1865.

The sulphur is met with in these mines as in Sicily in the native state. The company possesses several exten-

sive mines, four of which, Formignano, Fosso, Luzzana, and Montemauro are in the province of Forlì; and two, those of Marazzino and Perticara, in the province of Pesaro, producing together about 5,900 tons of refined sulphur, of which 800 are ground and sold for the sulphurization of vines. The mines are worked by galleries and shafts, hich whave already attained in some instances a depth of 125 fathoms, and as the profits are very considerable they may be ranked among the most important mines of the Italian Continent.

**12 ROYAL ITALIAN COMMISSION, Turin.**—Specimens of the stones employed in building the New Central Railway terminus at Turin, and for completing the Carignan Palace.

**14 SANTINI AVV. GIUSEPPE, Seravezza (Lucca).**—Statuary marble from the quarries of Arni, Seravezza. M., London, 1862; M., Dublin, 1865.

It is a popular opinion that the best statuary marble comes exclusively from Carrara. The quality of the marble found there is indeed excellent; that from the quarry of Crestola, about a mile above the town, has the most beautiful and homogeneous crystalline structure and exquisite warm tint, so that it has been much sought after by sculptors for many centuries. Numerous other quarries at Carrara also furnish first-rate marble; in other instances they are of a more or less dead white, which imparts a heavy stony appearance to a statue.

Seravezza statuary marbles have a finer grain than those of Carrara, and are extremely beautiful; they were largely employed by Michael Angelo, who was the first to discover and open the quarries on the hitherto inaccessible summit of the Monte Altissimo, though these quarries were neglected until late years. After the lapse of three centuries the late M. Henraux explored the continuation of the Altissimo southward, at a spot called the Giardino, and Chev. Simi the cavern on Monte Corchia. Both succeeded at length in opening up extensive quarries of the best statuary marble, but not before they had each spent a fortune in making roads and inclined planes for the conveyance of the produce down to the valley. About 35 years ago Count Guerra, and subsequently several other gentlemen at Massa, explored the mountains above that town, between Carrara and Seravezza, and many quarries have since sprung up there to compete with those of Carrara.

All these are on the rugged slopes of the Appuan Alps facing the sea, and easiest of access from the coast.

Nothing of importance has been yet done on the inland flanks of the Appuan Alps, known as the Garfagnana, although the mountains are there not less rich in the finest marble of the most varied kinds, both for architectural and statuary purposes.

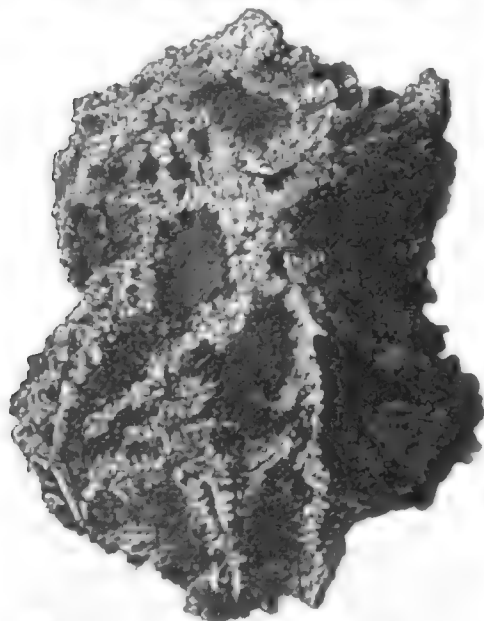
Among those who have sought to open quarries in this part is the exhibitor, who sends specimens of statuary marble from the quarry of Arni, close to those of the Altissimo and Giardino, and, as mentioned above, on the inland slope on the mountains. Many blocks lie on the spot whence they were blasted, and in colour and crystalline structure are almost identical with the marble obtained from the two last-mentioned quarries, but they cannot be removed for want of roads.

15 SARDINIAN SALT WORKS COMPANY, *Genoa*.—Table salt; impure sulphate of magnesia; impure sulphate of potassa. M., London, 1862; M., Dublin, 1865.

The Sardinian salt works are situated at two points on that island, at Cagliari, and Carloforte. They belong to the Government, but were leased for 30 years to the present company in 1852. The number of persons employed all the year round is about 530, which is increased during the season of collecting the salt to 775, including boys, peasants, labourers, inspectors, galley prisoners. At Cagliari the season for collecting salt lasts from July 20 to October 15, while at Carloforte it is much shorter, but the works are insignificant.

The annual produce of table salt, in 1852, was 30,000 tons; the present produce is 140,000 tons; of which the Government purchase 52,000 at a fixed price, the rest being exported to Norway, Sweden, Russia, and the United States of America; besides from 6,000 to 8,000 tons of crude sulphate of magnesia and 2,000 or 3,000 tons of crude sulphate of potash. These two last products are obtained from the mother liquor after the deposition of the table salt.

16 VECCHI, Col. AUGUSTO, *Castellammare, Naples*.—Nugget of native gold found near Sestri Levante (*Genoa*) in a fault in the serpentine, of the tertiary period.



Nugget of crystalline gold (actual size).

This mine was worked many years ago, but the operations were abandoned. In 1856 the re-search for ore was resumed, and the following year the Government granted the proprietors a concession of 251 hectares.

The mountain, in which the mine of Monte Loreto is situated, is bounded by two torrents, which, in the lower part of their course, serve for the perforation of the copper ores of the mine of Casati, belonging to the

Victor Emmanuel Mining Company. The copper deposits are found in Diallagri serpentine in numerous places in the mountain. The nature of the rock is very varied, but the gold is found at the line of junction of the white quartz and the *gabbro rosso* (metamorphosed marls which have assumed the character of friable schists) and the dark green serpentine, and hitherto has only been met with in a single branch of the Marsala level.

Numerous levels and shafts have been made to explore the mineral deposit; these amount, in the aggregate, to 1,500 fathoms; 30 or 40 men and girls are employed during the day, and these extract from 300 to 350 tons of ore annually, containing from 10 to 30 per cent. of copper.

The discovery of gold was made in October, 1864, in the Marsala level, after the explosion of a mine, when some beautiful lumps of native gold were perceived adhering to the quartz, and weighing from 700 to 820 grains. A few days afterwards other pieces were found between the *gabbro rosso* and the white quartz; the largest weighing 14 ounces, numerous others vary from 7 to 8 ounces, but the production of gold is very irregular, and disappears, to be again taken up after working for several weeks.

On subjecting to a chemical analysis a ton of the rock in which the gold is found, the following result was obtained:

Copper,	-	-	60.000
Silver,	-	-	2.605
Gold,	-	-	0.287
Matrix,	-	-	937.105
Loss,	-	-	0.003

1,000.000

The masses of gold separated from the rock are so pure that they sell from gr. 2.80 to gr. 2.90 the gramme. The specimen, of which a cut is given, possesses peculiar importance, geologically, from the fact of its being arborescent, and offering several well defined dodecahedral crystals, proving that the gold occurs here *in situ*, all the more interesting as this serpentine is an eruptive rock of the tertiary period, and is the very rock in which the principal cupriferous deposits of Italy are situated, so that we may yet hope to find widely extended, if not rich, gold fields throughout the kingdom.

17 VERGOTTINI, NAZZARO, *Bellano, Como*.—Galena from Valmarcia, near Introbbio (*Como*).

18 LENTINI, ROSARIO, *Palermo*.—Bituminous marl from Checco (*Girgenti*); native sulphur from the solfatara of Cinti (*Girgenti*); manganese ore, from Castelvetro (*Trapani*). H. M., Dublin, 1865.

19 ADRAGNA, BARON GIROLAMO, *Trapani*.—Refined bay salt, from the salt works at Trapani.

20 CATANIA SUB-COMMITTEE FOR THE DUBLIN EXHIBITION.—Sulphur in cakes, from the mines of S. Giuseppe, solfatara of S. Filippo d'Agira; common from the solfatara of Colombo, near Raddusa; from the mines of Floristella (*Cataniastretta*); from the mine of S. Giuseppe, near S. Filippo d'Agira (*Catania*); from the mines of S. Filippo, near S. Filippo d'Agira (*Catania*).

## SECTION II.—CHEMICAL AND PHARMACEUTICAL PROCESSES AND PRODUCTS.

[Number of Exhibitors 21. Of these 1 obtained a prize medal at the Paris Universal Exhibition in 1855, 3 at the Italian Exhibition at Florence in 1861, 3 at the London International Exhibition in 1862; and at the Dublin International Exhibition, 1865, 11 received medals, and 5 honourable mentions.]

22 ANTONINO, BARON CRISTOFORO, *Scordia (Catania)*.—Essential oil of lemons; of oranges; of orange flowers. M., Dublin, 1865.

23 BANDIERA, DR. GIUSEPPE, *Palermo*.—Hæmostatic water, price 4s. per bottle.

24 BERNCASTLE, ERNESTO, 7, *Largo S. Francesco di Paola, Naples*.—Cosmetic vinegar; syrup for coughs and sore throats; pectoral lichen and liquorice pastilles.

**25 CAMPISI, ALFIO, Militello (Catania).**—Citric acid. Price per cwt £14 11s.

**26 CANDIANI & Co.,** manufacturers, 3052, *Borgo S. Vincenzo in Prato, Milan.*—Common and rare chemicals. Samples illustrating the manufacture of paper from woody fibre. M., Dublin, 1865.

Not many years ago there were in the province of Milan but few laboratories belonging to the principal chemists, where pharmaceutical products were prepared, and the acids employed in the arts were almost exclusively obtained from abroad.

There are now in Milan and its environs 6 manufactories of chemical products employed in the arts, among which that of Candiani and Co. holds an honourable position. They obtained a silver medal in 1863 from the Royal Lombard Institution of Science, Letters, and arts; and employ 32 men, 20 by day and 12 by night.

The principal products manufactured consist of acids and dyes, which have been hitherto exclusively consumed in Italy. Candiani and Co. employ the best and most approved apparatus, and have introduced such improvements and modifications as are essential to enable them to obtain good products at a low price and with due regard to safety.—Dr. GIOV. PISANI

**27 CATANIA SUB COMMITTEE FOR THE DUBLIN INTERNATIONAL EXHIBITION.**—Liquorice roots and stick liquorice; raw soda; crude and manufactured tartaric acid. M., Dublin, 1865.

**28 CIARAFI, GIUSEPPE, Florence, and CONVENT OF THE SERVITE FRIARS, Sienna.**—Crystallized bicarbonate of potash, price £84 per ton; bicarbonate of soda, £30 per ton. M., Florence, 1861; M., London, 1862; M., Dublin, 1865.

Obtained by submitting, in the former case, a solution of commercial potash, and, in the latter, of crude soda, to the action of the carbonic acid evolved spontaneously and in great abundance, from the mineral spring of Cinciano, near Poggibonsi (Sienna), belonging to the convent of the Servite Friars.

Pure protocarbonate of iron, price per lb., 11s. Obtained by the double decomposition of solutions of sulphate of iron and an alkaline carbonate, subsequently washed with distilled water and dried in an atmosphere of the pure dry carbonic acid gas evolved from the spring of Cinciano—a process which could not be followed in an ordinary manufactory.

**29 COMPAGNA, Baron LUIGI, manufacturer, Corigliano (Calabria Citeriore).**—Stick liquorice, large and small. H. M., Dublin, 1865.

The liquorice plant grows perfectly wild in Calabria, and spreading its roots at a considerable depth under ground, does not interfere with surface vegetation, so that it is customary to sow wheat, Indian corn, cotton, or other seeds in the fields in which the liquorice flourishes; the roots are dug up once in three years.

The exhibitor has two manufactories; one at Corigliano, the other at Cassano. He employs 4 hydraulic presses, 12 iron presses, and 32 pumps, made by Macry, of Naples, and annually digs up 1,500 tons of roots, from which he obtains 200 tons of liquorice, which after being separated into three kinds, stamped "Duca Cassano," and "Duca Corigliano," is shipped to Naples in his own vessels, and thence exported to England, Scotland, the United States, &c., being sold at about £80 per ton.

**30 CONSANI, ERMOLAO DI R., Leyhorn.**—Pigments: Baltimore and common chrome yellows. M., Dublin, 1865.

**31 COSSINI, heirs of LUIGI, Florence.**—Shoe blacking; grease for wheels and machinery; polish for harness; varnish for leather, &c. M., Paris, 1855; M., Florence, 1864; H. M., Dublin, 1865.

**32 DE LUCA, Prof. SEBASTIANO, Royal University, Naples.**—Mannite from the leaves, flowers, and fruit of the olive tree. M., Dublin, 1865.

Mannite exists in different proportions in every part

of the olive tree; the leaves, flowers, and fruit containing the greatest quantity—the root, wood, bark, and branches rather less. This saccharine principle is not always found in the same quantity at all stages of vegetation; at the period of blossoming it accumulates in the flowers and diminishes in the leaves: the fallen flowers having once completed the phenomenon of fecundation no longer contain any mannite; it has likewise been found impossible to obtain the slightest traces of it in the yellow fallen leaves. Mannite exists in the fruit as long as it continues green, diminishing in proportion as it ripens, and disappearing entirely when it becomes perfectly ripe and contains the greatest quantity of oil.

The leaves, with which the olive tree is always covered, are never devoid of more or less mannite, as long as they continue green; and as soon as they begin to turn yellow others have already taken their place and would appear to accumulate, so to speak, the materials elaborated by their predecessors, and assume their functions. Many other substances are found in the leaves of the olive tree besides mannite: there are colouring matters and especially the chlorophyl which accompanies the mannite and undergoes similar changes; saccharine principles which have the property of facilitating fermentation in contact with yeast, as also of reducing tartrate of potash and copper; organic acids, and other matters not well defined.

**33 GAROFOLLETTI, FERDINANDO, chemist, 28 via Sta Maria, Milan.**—Black ink fluid. The same crystallized. H. M., Dublin, 1865.

Various as are the modes of preparation and the materials employed in the manufacture of black ink obtained from different sources it must be confessed that it is not easy to procure it of a kind fulfilling sufficiently the desiderata of being intensely black, flowing, and unalterable after a lapse of time.

The exhibitor has made many experiments on black ink and carefully studied its preparation, and he conceives that he has finally succeeded in obtaining a fluid free from the inconveniences inseparable from the majority of black inks hitherto known.

**34 KERNOT, GIUSEPPE, 14 Strada San Carlo, Naples.**—Cold drawn castor oil; oil of sweet almonds; oil of bergamot; oil of lemons; walnut oil; purified cod-liver oil; cod-liver oil with iodide of iron; olive oil; resublimed muriate of ammonia; ammonio-chloride of iron; acetate of potash; soluble potassium tartrate of iron; bitartrate of potash: tartrate of potash (neutral); manufactured boracic acid; castor-oil seeds; antifebrile elixir. M., Dublin, 1865.

**35 MELISSARI, FRANCESCO SAVERIO & Co. Reggio di Calabria.**—Essential oil of bergamot and other oranges; essential oil of lemons. M., London, 1862; Dublin, 1865.

**36 MESSEDAGLIA, DOMENICO, Brescia.**—Mineralized anatomical preparations, preserved without spirits, by the exhibitor's process. M., Dublin, 1865.

**37 MIRALTA BROTHERS, manufacturers, Savona (Genoa).**—Glue; cream of tartar, £100 per ton; tartaric acid. M., Florence, 1861; M., London, 1862; H. M., Dublin, 1865.

**38 ORETI, DEMETRIO, manufacturer, Arezzo.**—Carbonate of lead.

**39 PARENTI, GALGANO, chemist, Sienna.**—Asparagine—annual produce, 4 cwt.; caffeine; citrate of caffeine; biniodide of mercury. M., Dublin, 1865.

**40 PIERINI, BALDASSARE, Florence.**—Inodorous matches made without phosphorus or sulphur, in wax and wood. H. M., Dublin, 1865.

**41 RANIERI, Prof. ANGELO, 19 strada della Pace, a Chiaia, Naples.**—Common bay salt evaporated from sea water by volcanic heat in 30 hours, at the Bay of Maronti, Ischia. Per ton, 10s. 6d. Refined table salt obtained from the preceding; per ton, £7 8s. M., Dublin, 1865.

**42 MUNDO, GENNARO, 44 strada Arcangelo a Raiano, Naples.**—Hæmostatic water.

## SECTION III.—SUBSTANCES USED AS FOOD.

[Number of Exhibitors, 120: exhibitors represented collectively, 68. Of these 42 obtained prize medals at the Italian Exhibition at Florence in 1861; 22 obtained prize medals and 10 honourable mentions at the International Exhibition of 1862; 23 received prize medals at the Turin National Wine Exhibition of 1864; finally, at the Dublin International Exhibition, 1865, 24 received prize medals and 19 honourable mentions.]

**46 AGRICULTURAL ASSOCIATION, Lucca.**—Agricultural produce of the province of Lucca, by various exhibitors:—Olives, best Lucca oil, known as "from the six-mile circuit," by various exhibitors; do., known as "from the coast;" common washed olive oil; commonest olive oil, made from waste; olive oil cake. Wines:—**MUONANI, Marquis ANTONIO, S. Gennaro.**—Choice wine; vintage of 1853; wine of 1863. **GIORGIO Prof. LUIGI, Tofori**—Orzese wine of 1846; M., Turin, 1864; *Alcatice* wine of 1863; common table wine of 1863. **MAZZAROSA, Marquis, San Pietro a Martelliano.**—White Muscat of 1861; *Occhio di Pernice* of 1863; M., Turin, 1864. **GUERRA, Veneri.**—Choice wine of 1864. **BERNARDINI, Countess ISABELLA, Aquila.**—Common table wine of 1864. **LUCCHESINI, Marquis, S. Pancrazio.**—Common wine of 1863; Muscat of 1847. **PISANI, Chev. S. Concordio di Moriana.**—Common wine of 1863. **PIRANTONI, BROTHERS, S. Concordio di Moriana.**—Common wine of 1863; fresh chestnuts; dried do.; chestnut flour; agricultural seeds grown in the province of Lucca; white wheat (*grano gentile*); *Bianchetti* wheat; *Tosetto* wheat; Spring wheat, *grano marzuolo*; *Martellino* wheat; barley; naked wheat (*Triticum dicoccum*); *Scandella* wheat (*T. dicoccum*); rye; millet; panicum; *Saggina pratense*; *Saggina* of the Maremma; *spargola, Saggina*; Indian corn; red and white kidney beans; black eyed kidney beans, *faggioli dall'occhio*; small kidney beans; chick peas; broad beans; vetches; lupins; American rice and Chinese rice, grown at Massaciucoli by Marquis Eugenio Minutoli Tegrini.—(See Sections IV. and IX.)

**47 ARIANO, FELICE, via Vanchiglia, Turin.**—Grissini (bread) of three kinds.

The name owes its origin to the inventor, Dr. Grissini, who sought to offer the most digestive form of bread, in which he has admirably succeeded. Grissini is commonly eaten at dinner in Turin and the principal towns in Piedmont. In outward appearance it resembles macaroni, but it is not hollow. It is made in lengths of about 2½ feet, is crisp and sweet, and has a delicious taste, requiring no butter. The various kinds of bread made in Turin are:—Best white bread, made from pure flour of red wheat, containing not less than 10 per cent. of gluten, and leaving 15 per cent. of ashes on incineration. It is made into four principal shapes: 1st. Grissini, of two dimensions, finest and household; 2nd. Small rolls or cakes of various forms, containing on incineration 1·70 per cent. of ashes; 3rd. Bread for soup, almost cylindrical; 4th. Semola bread, the most expensive of all, containing 15 per cent. of albumen and gluten. Common household bread, not so white as the former, being made from white wheat flour, from which the whole of the fine bran has not been removed, with the addition of the remains of the best flour, the semola of the preceding kind, and a small quantity of rye flour. It is both wholesome and nourishing.

Brown bread, made from white wheat flour, retaining almost all the bran, mixed with a little rye flour. Containing as it does less gluten than the above kinds, it is not so nutritious.

Military bread.—The wheat flour is deprived of 15 per cent. of the bran. It contains 10 per cent. of gluten and albumen. A soldier's ration is 26 ounces.

Ship biscuits.—Deprived of 20 per cent. of the bran. A sailor's ration is 19 ounces.

The mean price of bread in Turin per lb. avoirdupois from 1859 to 1865, has been:—For Grissini, best bread,

2½d.; small loaves, rolls, and bread for soup, 1½d.; household or "seconds" bread, 1½d.

**48 ALONZO, Chev. ANTONIO, Catania.**—Wine grown on the exhibitor's estate at Fontana, M., Florence, 1861; M., London, 1862; H. M., Dublin, 1865.

**49 ALONZO, GIUSEPPE, manufacturer, Savona (Genoa).**—Alimentary paste for soup. Price £2 per cwt.

**50 BALLARINI, GIUSEPPE, Rocabianca (Parma).**—Ham cured in 1865, to be eaten raw or cooked. *Culatello*, made in 1865, fit to keep for two years; sausages. Price, 11d. per lb. Annual produce from 20 to 30 tons. H. M., Dublin, 1865.

**51 BALLER, GIUSEPPE, and Co., manufacturers, Cambiano (Turin); office in Turin, 35, via della Provvidenza. Turin Vermouth.** Price, 18d. per bottle, or £4 12s. per barrel of 22½ gallons. M., Florence, 1861; H. M., London, 1862; H. M., Dublin, 1865. Annual produce about 20,000 gallons.

**52 BANDINI, Prince SIGISMONDO, Fiastra (Macerata).**—Hard wheat.

**53 BARI, FRANCESCO, Fasano (Terra di Bari).**—Figs, price 18s. 6d. per cwt. Fine and common olive oil. This oil is obtained from the same olives as those used for making lamp oil, the only difference being in the care with which the fruit is selected and prepared. The olives are plucked before they are over ripe, and the utmost cleanliness is observed in bruising them, as well as in filtering the oil through several layers of clean cotton wool, whereas the lamp oil is made from the perfectly ripe olives which have fallen from the trees, and are placed in large heaps, from which a certain quantity is taken at any time during the Winter season in order to be pressed; the consequence of this treatment is that the olives undergo lucipient fermentation and yield strong oil. The latter system of manufacture prevails principally in the adjoining province of Lecce, the oil being mostly exported from Gallipoli for the use of machinery. The more refined quality is manufactured in the province of Bari and shipped from the ports of Bari, Monopoli, and Mola for Leghorn and Genoa, where it is sold to foreign purchasers as Lucca or Nice oil, with which it competes in taste and perfection. The olive trees in this province attain a height of thirty feet, the trunks being frequently three feet in diameter; the branches are spreading and the fruit excellent. A full sized tree yields about two hundred weight of oil. The whole sea-board from Bari to Brindisi, a distance of seventy-five miles, for a breadth of seven miles, is a continuation of luxuriant oliveyards. The railway from Turin to Bari and Brindisi was completed only a few months ago, and ere long will become the main line of communication between Europe and India.

**54 BAZZIGHIER, LUCIO, and Co. Sassuolo (Modena).**—Modena *Rinfresco*. M., London, 1862; M., Dublin, 1865.

**55 BELLENTANI, GIUSEPPE, Modena.**—Preserved pork; *Coppa*; *S. Secondo* shoulder ham; *Mortadella* sausages; *Zampone*; *Cappelletto*; Florentine sausages; balsamic vinegar of 1800, sixty-five years old. M., Florence, 1861; M., Dublin, 1865.

**56 BELTRANI, GIUSEPPE, Trani (Terra di Bari).**—Olive oil; Muscat wine; raisins; figs.

**57 BERNARDI BROTHERS, manufacturers, Borgo a Buggiano (Lucca).**—Biscuits called *Cantucci*. M., Florence; H. M., London, 1862.

**58 BERRUTI BROTHERS, GIUSEPPE and CARLO, Grinzano d'Alba (Corti).**—Red and white *Pineau* wine, vintage 1864; *Nibbiolo* vintages 1862 and 1863. H. M., Dublin, 1865.

**59 BIFFI, PAOLO, confectioner to the royal household, 1922, Corsia del Duomo, Milan.**—Panatone (pastry); various kinds of liqueurs; chocolate; confectionery. M., Florence, 1861; M., London, 1862; M., Dublin, 1865.

**60 BUCCARDI BROTHERS, Candela (Capitanata).**—Olive oil; Muscat wine, vintage of 1861; *Alcatice, Santo* wine, 1861; cow's milk cheese, made in October, 1863, and November, 1864. M., London, 1862; H. M., Dublin, 1865.

61 BONACCORSI, Count FLAVIO, *Potenza Picena (Macerata)*.—Olive oil.

62 BOVAMICI, FERDINANDO, *Vico Pisano (Pisa)*.—Olive oil, expressed cold, 1864 and 1865. £3 2s. per cwt. "Green paste" washed oil from the skins of the olive, expressed cold, for dyeing and manufacture of white soap. £2 per cwt. "Yellow paste" ditto, expressed hot, for manufacture of mottled soaps. £1 19s. 3d. per cwt. M., Florence, 1861; M., Dublin, 1865.

63 BOSCO, PIETRO, and SOGA, *Rod (Cortina)*.—Sweet and bitter Barolo wine. 1s. per bottle.

64 BOTTAMINI, BARTOLOMEO, *Bormio (Sondrio)*.—Honeycomb; honey. Price, 1s. 10d. per lb. M., Florence, 1861; M., Dublin, 1865.

65 BULLI BROTHERS, manufacturers, *Florence*.—Italian paste of various forms, for soup. M., Dublin, 1865.

66 BUREI AVE, BERNARDINO, *Cinigiano (Grosseto)*.—Olive oil.

67 CALDERAI, ANGILO, *Florence*.—Sausages, 1s. 3d. per lb. M., Florence, 1861; M., London, 1862.

68 CAMAJORI, GIOVANNI, *Sienna*.—Fine olive oil; choice and common wine.

69 CARBONE, SALVATORE, manufacturer, *Catania*.—Italian alimentary paste for soup, 28s. per cwt. to 32s. 6d. Best and common red *Farro* wheat (*Triticum durum*), grown in the plain of Catania, and used for the manufacture of macaroni. 10s. 5d. and 9s. 7d. per cwt. M., Dublin, 1865.

70 CARPANO, GIUSEPPE BERNARDINO, 18, *Piazza Castello (Turin)*.—Turin vermouth, 4s. per gallon; £4 16s. per barrel, 22½ gallons. Quinine to be drunk with the vermouth, 2s. 6d. per bottle; £4 16s. per barrel, H. M., Dublin, 1865.

71 CARPI, TELESFORO, manufacturer, *Parma*.—Hams, cured in 1864; four shoulder hams, cured in 1865. Price 1s. 2½d. per lb.

72 CATANIA SUB-COMMITTEE FOR THE DUBLIN INTERNATIONAL EXHIBITION.—Wine grown on the estate of Cipollata; at Cardillo. S. Agostino wine grown at Cardillo. Wine grown at Motta; at the Terre forti. S. Agata wine. S. Benedetto wine. Sta Chiara wine. Bosco wine, grown on the flanks of Mount Etna. S. Placido wine. Olive oil from Noto; price per cwt., £2 3s. 3d. Tobacco leaves in bundles, grown at Catania. Snuff made from S. Antonino native tobacco. *Montagna* roll tobacco from native plants; Dutch roll tobacco. M., Florence, 1861.

73 CERCHI BROTHERS, FILIPPO and PIETRO, *Monte Catini di Val di Nievole (Lucca)*.—Olive oil of 1865; Aleatico wine of 1862.

74 CICCOCINI, SILENTE Marchioness ONTESSA, *Cinigiano (Macerata)*.—Olive oil.

75 CINIANO, FRANCESCO (late NICOLA BARACCO and Co.)—*via Dorograsa, Turin*.—Turin vermouth; essences of punch; candied fruit; confectionary; Fondant's and best bon bons; *Barbera* wine. H. H., Dublin, 1865. This house was established, in 1864, by the exhibitor's father.

76 CIOPI, LORENZO and SETTIMO, manufacturers, *Pontedera (Pisa)*.—Italian paste. H. M., London, 1862; M., Dublin, 1865.

77 COMPAGNA, Baron LUIGI, manufacturer, *Corigliano (Calabria Citeriore)*.—Red wine and olive oil.

The olive tree is extensively cultivated in this province: the exhibitor annually expresses about 200 tons of oil, shipping it in his own vessels to Naples, where it is purchased for exportation at about £3 per cwt. The works contain a portable steam engine, which likewise serves for thrashing corn; water wheels, 6 hydraulic presses, and 15 iron presses—all manufactured by Massey, of Naples. *Provola* and *Caciocavallo*, cow's milk cheese. Annual produce 200 cwt. of cheese, sent to Naples, where it sells for about £4 per cwt.

78 COPPINI, GIULIO, *Chiusdino (Sienna)*.—Alkermes Price 2s. 6d. per bottle.

79 CORA BROTHERS, GIUSEPPE and LUIGI, manufacturers of wine and liqueurs, *via S. Teresa, Turin*, and

*Costigliole d'Asti (Alexandria)*. Liqueurs, wines, and vermouth. M., Florence, 1861; H. M., Dublin, 1865, for liqueurs, and H. M. for wines. (For illustration, see p. 416.)

The engraving represents the manufactory of Costigliole, seen from the direction of the railway, with which it is connected by a special branch. This establishment was commenced in 1860, by the present proprietors, who found it in the state of a common farm house. The arrangements necessary for the manufacture of wine on a large scale are only just completed. 157,000 gallons of wine were made in October, 1864, which, during the process of fermentation, required the employment of recipients capable of containing 225,000 gallons.

A manufactory of this extent is highly important and interesting in the present condition of Italy, the more so from the rapidity with which it has been erected, and the fact that the capital has been entirely the result of the exertions of the proprietors, who state that they were the first in Piedmont to establish a commerce of wine with foreign countries.

Up to 1859 the reputation of Messrs. Cora was entirely based upon their vermouth and liqueurs, manufactured in Turin, where it was impossible to make ordinary wine owing to the municipal taxes levied on the entrance of grapes into the city. The first wines were made at Costigliole in 1861, of which some samples are exhibited at Dublin. Those of 1862 were bad, so that it was not considered advisable to send them. The vintages of 1863 and 1864 were so abundant and the produce so excellent, that after filling all the cellars, the exhibitors were obliged to erect a temporary roof over the courtyard.

Messrs. Cora do not employ travellers, like most other houses, to push their products, but rely entirely on the credit which these acquire with the public. The wines are guaranteed not to contain any alcoholic addition, as is too frequently the case with those sold in commerce; in this manner not only is it possible for the fermentation to proceed without interruption, but the wines are far more wholesome. The deposit in the samples exhibited is a natural consequence of the newness of the wines, which were bottled before the cessation of the chemical changes, during which the colouring matter separates more or less according to the quality of the wine, whether sparkling or otherwise, its age, and the nature of the grapes employed.

Sixty-seven thousand gallons of vermouth are kept in store for shipment to South America, whither three quarters of the quantity manufactured are exported after having acquired sufficient age.

The grape disease has now so considerably diminished that it is to be hoped the wines of Italy may soon become an important article of export, especially those of the Piedmontese provinces, where the process of manufacture is being considerably improved, and the prices are falling to their original level.

80 COSENTINO, STEFANO, *Catania*.—Fine olive oil, grown at Francofonte (Noto).

81 COSTARELLI, MARTINO, *Catania*.—Wines grown at Nesima, near Catania. *Granatino* and *Rosa* wine. M., Florence, 1861; M., London, 1862.

82 CURTARELLI, GAETANO, *Cremona*.—Almond cake and *torrone* sweetmeat; *Cremona mostardo*, or fruit pickles; mustard jalap for fruit pickles.

83 D'ALBERO, ANTONIO, manufacturer, 218 and 219 *Strada Toledo (Naples)*.—Candied fruit, chestnuts, and vegetable marrow, 1s. 6d. per lb. Fruit preserves, 1s. 8d. per pot. H. M., Dublin, 1865.

84 DANIELLI, Dr. DOMENICO and BROTHER, *Buti (Pisa)*.—Olives preserved in spirits; dried olives; strong olive oil, 1865; sweet olive oil, 1865; yellow olive oil, 1862; white olive oil for perfumery, 1862; common dark yellow olive oil; common green; common white; olive skins pressed in order to extract the residual oil with sulphide of carbon; olive kernel oil, for burning; flour of olive kernels, for fattening pigs. M., Florence, 1861; M., London, 1862; H. M., Dublin, 1865.

Bati is situated five miles from Pontedera, at the elevation of 300 feet above the sea level, in a narrow valley enclosed by lofty hills on the N., S., and W.; for ages celebrated for the excellence of the olive oil they produce. This perfection has been attributed to a combination of circumstances—the nature of the soil, an argillaceous schist free from calcareous elements, and the topographical position protected from the sea breezes, for it has been observed by agriculturists that olives cultivated on calcareous soil and under the influence of the sea air are liable to turn rancid. In addition to this, the water is so pure as not to impart a bad taste to the oil. About 650 acres are laid out in the culture of the olive in this commune, which furnish 300 tons of olive oil, a quantity which, at £2 16s. per cwt., yields a gross revenue of £16,800.

The process of cultivation employed is very simple. The vineyards are annually weeded. Every alternate year the trees are pruned, and manure is employed once in four years. The fruit is bruised without addition of water, and pressed cold, employing the purest water possible. The exhibitor's oliveyards cover an area of about 65 acres, which, with an annual outlay of £650, yield produce valued at £1,650.

**85 DE FILIPPI, PAOLO, SERRA (Genoa).—**Wine of several kinds; price 1s. 8d. per bottle.

**86 DEL TOSCANO, MARQUIS, CASCIA.**—Wines grown on the estate of Corticato, near Catania, vintage of 1864: Muscat, Calabrian, Amarena of Marasso, and white wine. M., Florence, 1861; M., London, 1862.

**87 DI RIGNANO, MARQUIS, POGGIA (Capitanata).—**Best and common olive oil. M., London, 1862.

**88 ECONOMIC SOCIETY, SERRA (Genoa).—**Chestnuts; price 9s. per cwt.

**89 FANTOTTI & CO. BORGOMASSINO (Turin).—**Bonarda and Erbaluce wine of 1863; per bottle, 2s.

The grapes of which these wines are made are produced from old stocks, grown in poor soil on the hill slopes.

After gathering the perfectly ripe bunches they are laid out to dry on matting, carefully removing the defective fruit.

It is found preferable to place the grapes in lofty and well ventilated rooms, exposed to the sun. The windows are kept open as long as there is any wind and the weather is dry, but the are shut as soon as the atmosphere becomes damp, and a fire lit to preserve the fruit from mildew. The grapes being left thus spread out until they become quite dry the operation sometimes lasts until the end of March.

As the vines are sulphurized it is necessary to stone the grapes with the greatest care before pressing them, picking out the defective ones by hand. The juice is allowed to stand 24 hours and is then poured into casks or very large bottles: the former being sealed up after several days, the latter simply being covered over with paper to preserve the contents from the dust, and placed in dry warm rooms, but not exposed to the sun. As soon as the fermentation has somewhat diminished the bottles are partially corked up, completing the operation when it has entirely subsided. In the finest days of September or October the wine is bottled.

**90 FENEL, EMANUELE ORSINO, FLORENCE.**—Agricultural products from exhibitor's estate at S. Casciano.

1. Dry white Val di Greve, of 1861; 1s. 8d. per bottle. The grapes are slightly pressed as soon as gathered, and the juice passed through a wickerwork basket, and poured into barrels which are hermetically closed and allowed to stand for three years in a well ventilated apartment, after which the wine is fit for bottling.

2. Red wine of 1863; 3s. to 3s. 7d. per gallon. This is made in a different manner; the grapes are slightly trodden and put into a second vessel where they are again trodden and allowed to stand for 36 hours, when the juice is collected by an aperture in the bottom. After this the remaining pulp is put under a press, and



View of the Wine Manufactory of Messrs. Cora Brothers, at Costigliolo, near Asti.

the juice mixed with the former kind. During the process of fermentation the bung-hole is left open to prevent danger, and wine is constantly added to keep the barrel quite full. Fermentation has completely subsided at the end of a month, when the wine is changed, throwing away the dregs, and filling up the barrel with the juice of the same grapes set aside in flasks for the purpose. The process of filling up the barrel from the flasks is repeated several times until September, when the process of vinification is completed and the wine fit for bottling.

3. Common red wine of 1864. Made by the common Tuscan plan, the grapes being first trodden in the tubs and then placed in vessels where they are again trodden several times. At a certain period of the fermentation the vessels are covered over with a cloth and the wine allowed to stand for a month, after which it is barrelled, being fit to drink at the end of December. The residual pulp is again pressed and the juice obtained mixed with the rest.

4. Olive oil in flasks, 1863 and 1864. The season for gathering the olives begins in November. The quantity of oil obtained from the fruit increases as the season advances, though the superfine oil is obtained from the olives gathered earliest in the season. The olives are spread out in a ventilated apartment where they are left for several days to dry, they are then bruised under a vertical mill-stone turned by an ox, and reduced to the state of a coarse paste, which is put into hempen bags or network called *gabbie* or *buscole*, and subjected to slow pressure under a screw press. The oil thus expressed is allowed to clarify for several days in large earthenware vessels called *coccia*, glazed inside, and finally transferred to *orei* or *coppi*, likewise of glazed earthenware. The term virgin oil is applied to that pressed out during the first operation, and is the most esteemed. The residuum still contains oil though of an inferior kind.

Agricultural seeds, various kinds of wheat and barley; raw and cleaned Siamese cottons.

Pine seeds. These have very much the shape and taste of small almonds; the cones containing them are gathered at the beginning of Winter and dried in the sun or in an oven to make them burst. In some places they are also used for the extraction of oil, but in Tuscany they are generally eaten at dessert, or in cakes, called *Pisocchiate*; juniper berries.

*Iris* (*Iris formosissima*). The ground rhizomes of this plant furnish the cosmetic so well known all over the world as *orris powder* or *Florence iris powder*. The plant is indigenous in the neighbourhood of Florence, and is extensively cultivated in some parts of the province.

91 FORDEI, DAVANZATI ALESSANDRO, *Pale del Colle* (*Terra di Bari*).—Fine olive oil; wine; broad beans; almonds; hemp seed; linseed.

92 FORDEI, ALESSANDRO, *Bologna*.—Sausages; *capiccoli*; 4 boxes of sliced Bologna sausages, a few modes of preparation. M., London, 1862; H. M., Dublin, 1865.

93 FRANCIOSI, PIETRO, *Terriccola, near Peccioli* (*Pisa*).—Superfine olive oil, £3 5s. 6d. per cwt. M., Florence, 1861.

94 FRIGIERI, GIUSEPPE, *Modena*.—Florentine sausage; Zampone and Capello; balsamic vinegar. M., Florence, 1861.

95 GALLUCCI, MICHEL ANGELO, *Palma* (*Calabria Ultra prima*).—Wine grown in Palma, 1s. 5d. per bottle; white and red Calabrian; muscat; greco; red palmi; Aspromonte; prato; vinegar. H. M., Dublin, 1865.

96 GALVAGNO, GIUSEPPE, chemist, 8 via Duruguesse, *Torin*.—Galvagno's cough mixture.

97 GANCIA BROTHERS, Manufacturers, *Chirasso, Turin*.—Vermouth; Barolo wine; grown and made at Chirasso, near Bra (*Coni*). H. M., Dublin, 1865.

98 GIANCOLA, LEONARDO, *Modagno, Terra di Bari*.—Mustard seed, 16s. per cwt.

99 GIOIELI, TRIGONA VINCENZO, *Catania*.—Wine grown at Palma; white *Goumarria* of 1862, 19s. 2d.

per gallon; *Affanella* of 1863, 17s. 8d. per gallon; *Cilegia* of 1864; *Marsala* of 1861, £1 1s. 6d. per gallon. M., Florence, 1861; M., London, 1862.

100 GRAZZINI, PELLEGRINO, Bailiff of the estate of *Collecchi, near Pontedera* (*Pisa*).—Best olive oil, made without water; common do., expressed with water; vermouth; red wine, made with dried grapes.—H. M., Dublin, 1865.

101 GRISALDI, TAJ CARLO, *Siracusa*.—*Afresco* wine, per bottle, 1s. 10d.; fine olive oil, per gallon, 4s. 10d. M., Florence, 1861; M., London, 1862.

102 GUELFI, GAETANO, manufacturer, *Novareccio* (*Pisa*).—English biscuits. M., Florence, 1864; M., London, 1862; M., Dublin, 1865. The exhibitor introduced the manufacture of English biscuits into Italy in 1856, and was the only maker of them up to 1860, since which time other persons have made them.

104 IANARDI, PIETRO, oil refiner, *Lepora*.—Pale yellow Tuscan olive oil, made from olives gathered in January, 1865, refined by exhibitor, in bottles and flasks; ditto, made in March, 1865. M., Dublin, 1865.

105 JACONO, ANTONINO, tobacco manufacturer, *Monza*.—Cigars. H. M., Dublin, 1865.

106 JANNELLI, Baron ENRICO, grower, *Termini Imerese* (*Palermo*).—Best olive oil, grown at Bragosa. M., Florence, 1861.

The hills in the neighbourhood of Bragosa have an eastern and southerly aspect, and are situated close to the sea shore. The ground is covered with pebbles and gravel, but the subsoil is deep and in some places marly. The method of preparing the oil is simple. At the end of October, when the olives become yellowish and tinged with red spots, the peasants proceed, on dry days, to gather the fruit, putting it in baskets lined with linen. It is then spread out in a thin stratum on the wooden floor of a well ventilated apartment, taking out all the over-ripe or defective ones. After being dried in this manner for three days it is bruised and then put in the press. The liquid is placed in covered vessels for twenty-four hours, and before fermentation has set in it is filtered through linen in earthenware pans. In a week's time it is filtered again through cotton wool, to separate the residual pulp, which contains the colouring matter, and deteriorates the oil. In these operations the utmost care is necessary to keep all the vessels and matter with which the oil comes in contact extremely clean and dry, as it easily becomes rancid and undergoes a chemical change.

107 LAMBILLA, FRANCESCO, *Alassano* (*Terra di Bari*).—Linseed, 8s. 10d. per cwt.

108 LARENTINI, GIUSEPPE EMILIO, *Bologna*.—Round and old triangular Bologna sausages (*mortadella*), 1s. 3½d. per lb.; oblong (*coppa d'istate*), 1s.; long soft sausages, 11d. H. M., London, 1862.

109 LANCIA BROTHERS, *Plaza del Palazzo di Città, Turin*.—Tin cases of preserved provisions for military stores. M., Florence, 1861; M., Dublin, 1865. The exhibitors first came into notice in 1855, during the Crimean war, when they largely supplied the allied forces with preserved provisions, chiefly beef; as they did again in 1859, the French and Italian troops in the war of independence. Lastly, in the brief period of three months, in 1864, they consigned to the Government 700 tons of preserved provisions.

110 MAJORANA BROTHERS, SALVATORE and GIUSEPPE, Barons of Nicchiara, *Catania*.—Agricultural produce from their estates: vinegar, from Militello, 11d. per gallon; wine, from Troldo, per gallon, 2s. 9d.; olive oil, from Nicchiara; ditto, flavoured with essential oil of oranges; ditto, from Magnini, £2 16s.; snuff, made from tobacco grown at Militello; Lecce snuff; rice grown in the plains of Catania, per cwt., 14s.; hemp seed; canary seed; *Mallero mustaci* seed; sesamites; white and black lentils; castor oil seed (*Ricinus lividus*); linseed; peas; broad beans; chick peas; red kidney beans; kidney beans; chick beans; carob beans (*Ceratonia siliqua*), price per cwt., 4s.; walnuts, per gallon, 10d.; pickled olives; olives prepared in oil;

salted black olives; honey. M., Florence, 1861; M., London, 1862; H. M., Dublin, 1865.

111 MALATESTA, AUGUSTO, *Modena*.—Lambrusco wine of 1863 and 1864.

112 MANGUSA, MATTEO, *Catania*.—Wine of 1864, grown on the estate of Terrebianche. M., Florence, 1861.

113 MARANESI, GASTANO, *Bologna*.—Muscat wine, 10s. 10d. per gall., made with raisins of the vintage of 1862, grown at Gaibola; decanted after 15 days to separate the tartar. This operation was repeated in March and August, 1862, when the wine was bottled, since which time it has formed no deposit.

114 MARCHI, ANTONIO, *Parma*.—Forage seed; ray grass; clover; Parmesan cheese. M., Dublin, 1865.

115 MARCIALIS, GIUSEPPE, *Cagliari*.—Various wines.

116 MARGEST, GIOVANNI, *Savona (Genoa)*.—Liqueurs and effervescing drinks. M., Florence, 1861; H. M., London, 1862.

117 MARINELLI, EMILIO, manufacturer, *Parma*.—Corn and rice flour; best and common Italian paste. M., London, 1862; M., Dublin, 1865.

118 MARINI, CIRO, manufacturer, *Bologna*.—Liqueurs at 9s. per bottle. Rosolio of the following kinds:—Bitter almonds; anisette; alkermes; cedro; coffee; juniper; perfetto amore; olio di venere; cummin; peppermint; cinnamon; rose. Rinfresco di portogallo, 3s. 2d. per gallon; Venetian arrack, 5s. per gallon; Dutch curacao, and Zara marachino, 9s. 4d. per gallon.

119 MARTINI, SOLA & Co., manufacturers, *Chieri (Turin)*; Office, 34, via Carlo Alberto, Turin.—Vermouth. Price per barrel (of 22½ gallons), £4 8s. Collection of liqueurs, 2s. per bottle:—Alkermes; white, yellow, and green Chartreuse; Vanilla chocolate; strawberry; elixir with quinine; Genepis des Alpes; glacial peppermint; Mocha coffee; cherry ratafia; Sambayon; Hortuaglor; Fernet; Trapestino. M., Dublin, 1865.

This house carries on a considerable business both in Italy and abroad, especially in vermouth. The exhibitor exported 20,000 cases of vermouth to South America in 1864.

120 MASOERO, LORENZO, manufacturer, 15 via della Providenza, *Turin*.—Vermouth.

121 MASSELLI, ANTONIO, *Sansevero (Capitanata)*.—Olive oil; hard wheat. H. M., London, 1862.

122 MERENDA, Count CREARE, *Modena*.—Chartreuse, yellow and white; Dutch curacao and anisette; Bordeaux anisette, per gallon, 18s.; Modenese rinfresco, 14s. 6d. per gallon. M., Dublin, 1865.

124 MINIEL, Dr. FRANCESCO CANDIDO, *Gioia del Colle (Abruzzo Citeriore)*.—Mustard seed.

125 MONCADA, ANDREA, *Catania*.—Wine from the Terre forti, near Catania. M., Florence, 1861.

126 MOSCA, FEDERICO, *Cagliari*.—Wines grown at Pixed (*Cagliari*); white and red wine vinegar.

127 NABI, GUGLIELMO, *Modena*.—Lambrusco wine of various vintages; Lambrusco wine of 1863; balsamic vinegar of 1761 (one hundred and four years old); vinegar of 1812 (53 years old). M., Dublin, 1865.

128 NOBILE, CARLOANTONIO, *Vieste (Capitanata)*.—Olive oil.

129 OREGGIA, Dr. MARCO, *Savona (Genoa)*.—Olive oil. Price 11d. per lb.

130 ORSI, RAFFAELLE & Co. *Bologna*.—Bologna sausages; soft sausages. H. M., London, 1862.

131 OTTOLINI, GUGLIELMO, *Lucca*.—Olive oil.

132 PAOLETTI, FERDINANDO, manufacturer, *Pontedera (Pisa)*.—Superfine wheat flour; white and coloured Italian paste of various kinds and forms, manufactured with red wheat; biscuits of various kinds. M., Florence, 1861; M., London, 1862; M., Dublin, 1865.

133 PARENTI, CIRO, *Massa di Cozzile, Pescia (Lucca)*.—Santo or raisin wine of 1864. M., Turin, 1864. Olive oil of 1865.

134 PARENTI, GIOVANNI, manufacturer, *Sienna*.—Best Panforte, sweetmeat. M., Florence, 1861.

135 PIZZONI, CESARE, wine grower, *Traversetolo*

(*Parma*).—Red and white wine from Montalugolo, Commune of Guardasone. M., Turin, 1864.

137 PEPI, NATALE, manufacturer, *Sienna*.—Panforte sweetmeat. Wholesale price, 6s. to 8s. per cwt.

This house has been established for half a century, and makes 18 tons of panforte annually.

138 PERATONER & Co., merchants, *Ontania*.—Linsed, 16s. per cwt.

139 PRATI, GIUSEPPE, manufacturer, *Alexandria*.—Elixir of the Great St. Bernard, invented by exhibitor; 2s. 9d. per bottle. Annual sale 6,000 bottles. H. M., London, 1862; H. M., Dublin, 1865.

141 RAVALDONI, FRANCESCO, *Bologna*.—Bologna and soft sausages.

142 RICASOLI, Baron Colonel VINCENZO, grower, *Florence*.—Mild and dry Riminese wine, grown at Port Ercole, on Mont Argenteale (*Grosseto*), vintage, 1863. Price 2s. 5d. per bottle. M., Turin, 1864; H. M., Dublin, 1865.

This wine partakes of the nature of Madeira and Sherry. It is supposed to have been introduced by the Spaniards while they occupied the Presidii.

143 RIZZA, GIUSEPPE, *Chiaromonte (Noto)*.—Olive oil.

144 ROUFF, J. grower, 145 strada, *Chiaja, Naples*.—White and Capri wine; white Lacrima; white and red Falernian.

145 ROYAL OENOLOGICAL COMMISSION, *Turin*.—Large collective exhibition of choice Italian wines, on behalf of the following growers and manufacturers:—M., Dublin, 1865.

1 BENEVO AVV., GIUSEPPE, *Cascine, Alexandria*.—Claret, 1859; white Muscat, made in 1865, 1s. 6d. per bottle. M., Turin, 1864.

2 COSTA BROTHERS, ANTONIO and BENEDETTO, *Alghero, Sassari*.—Torbato wine, 1863, 2s. 5d.

3 DE BENEDETTI (heirs of) late SALVADORE, *Aqui, (Alexandria)*.—Barbera, 1863; rather bitter, and sweet Barbera of 1864; common Dolcetto, 1864; 1s. a bottle; Grignolino, dry Barolo, sparkling Nebiolo, and sparkling Muscat of 1864, all 1s. 6d.; golden Muscat, 1845, 2. 6d.; rather bitter white wine, 1854, 1s. 6d. M., Turin, 1864.

4 CIGALA FULGOSI, Count PIETRO, *Nibbiano (Piacenza)*.—Choice white wine, 1844, 3s.; 1858, 2s. 6d.; 1860, 2s.; choice red wine. M., Turin, 1864.

5 DELLA TORRE Count CARLO, *Orio Caluso (Turin)*.—Dry white Orio wine, 1845; Orio Palleverde, 1847; Dry white Orio wine, 1849; all 4s. a bottle. Mixed Noretto and Nebbiolo, 1849, 3s.; mixed Burgundy, 1852, 3s.; claret, 1839, 5s.; sweet white wine, 1839, 5s.; dry white wine, 1863; sweet white wine of 1860, 2s. 6d. M., Turin, 1864.

6 GENTA, AVV., PAOLO, *Caluso (Turin)*.—White Caluso, 1853, 3s. 6d.; 1858, 3s.; choice red, 1859, 2s. 6d. M., Florence, 1861; M., London, 1862.

7 ZAULI NALDI, Count FRANCESCO, *Faenza (Ravenna)*.—Choice white San Mamante; choice santo or raisin wine; Muscat; piccolit; white zamone, all 3s. a bottle. M., Turin, 1864.

8 IVALDI, Dr. DOMENICO, *Morassio (Alexandria)*.—Choice red wine, 1863, 1s. 6d.; 1864, 1s.; choice red dolcetto, 1861, 1s. 6d.; 1863, 1s.; choice Bordeaux, 1863, 1s. 6d.; white Muscat, 2s. H. M., London, 1862; M., Turin, 1864.

9 DI SAN GERMANO, Marquis CASIMIRO, *Mazzè Canavese (Turin)*.—Dry white wine, 1840, 4s.; claret, 1858, 3s. M., Turin, 1864.

10 COLOMIATTI AVV., MELCHIORE and BROTHERS, *Chieri (Turin)*.—Barbarossa, 1856, 2s.; bitter Tokay, 1861, 2s. 6d.; Bonarda, 1860, 1s. 6d.; Muscat, 1863, 2s. M., Turin, 1864.

11 FULCHERI, ALESSANDRO, *Mondovì Breo (Cuni)*.—White Muscat, 1861, 2s.; ditto, 1862, 2s.; ditto, 1863, 1s. 6d.; ditto, 1864, 1s. 6d.; Barolo, 1861, 1s. 6d.; Dolcetto, 1863, 1s.; Barbera, 1863, 1s.; Brachetto, 1864, 1s. 6d.; common Dolcetto, 1862, 1s.; Nebbiolo, 1861, 1s. 6d. M., Turin, 1864.

12 VITIELLO, VINCENZO, *Torre del Greco (Naples)*.—Red and white Vesuvian Lacrima, 3s.

- 13 GABALDONI, VINCENZO, *Varise Ligure (Genoa)*.—Red wine, 1857, 2s.; ditto, 1859, 1s. 6d.; white and red wine, 1863, 1s. M., Turin, 1864.
- 14 OTTELLA, GIOVANNI, *Capriata d'Orba (Alessandria)*.—Fine Nebbiolo, 1863, 1s.; best ditto, 1863, 1s. 6d.; choice ditto, 1864, 1s.; best selected, 1864, 1s. 6d.; superfine choice, 1864, 2s.; Paglierino Cortese, 1863, 2s.; choice Paglierino Malmsey, 1864, 2s. M., Turin, 1864.
- 15 ALBERICI, FRANCESCO, *Cadorna (Paria)*.—Italian blood, 1863; ditto, 1864; fine Barbera, 1864; Malakoff, 1864; Aleatico, 1864; all at 1s. 6d.; Santo or raisin wine, 1849, 3s. M., Florence, 1861; M., Turin, 1864.
- 16 DE ILANIS, COME, GIACOMO, *S. Angelo Pesce (Abruzzo Ulteriore I.)*.—Dry white Abruzzo, 1865, 1s. 6d. per bottle. M., Turin, 1864.
- 17 BUKLI, ESUPERANZO, *Bobbio (Paria)*.—White Alicante, 1s. 6d. per bottle; white champagne, 3s.; Frontignan, Madeira, Malaga, and Marsala, all 1s. 6d.; Tokay, Rhine wine, and red Aleatico, all 2s.; red Alicante, Bordeaux, Burgundy, Catalonian wine, Isabella, Sardinian wine, and Barbera, all 1s. 6d. per bottle. M., Florence, 1861; M., Turin, 1864.
- 18 BENTONET SANCY, CHEV. MARFEDO, *Valmagra, Castel Ceriolo, Alessandria*.—Dry red wines:—Valmagra, 1858, 2s.; ditto, 1861, 1s. 6d.; ditto, 1863, 1s.; Marengo Noretto, 1863, 1s. 6d.; Grignolino and Barbera, 1863, 1s.; Montepulciano, 1863, 1s. 6d.; Castel Ceriolo, 1861, 1s.; Marengo, 1857, 2s.; Marengo, 1863, 1s. Dry white wines:—Marengo, Castel Ceriolo, Malmsey, Vermouth, of 1863, 1s. 6d. Sweet red wines:—Marengo Aleatico, of 1848, 1859, and 1861, 2s. a bottle; ditto, 1863, 1s. 6d.; Castel Ceriolo, 1861, 2s. Sweet white wines:—Marengo Cortese, and Muscat, 1863, 1s. 6d. M., Turin, 1864.
- 19 ILACCI, MARQUE GIOVANNI BATTISTA, *Molara (Alessandria)*.—White Villa Campale Muscat, 1863, 3s.; common red ditto, 1s.
- 20 VARELLO, FRANCESCO, wine manufacturer, *Asi (Alessandria)*.—Red Natalino, 1859, 2s.; Barbera, 1840, 4s.; red Natalino, 1847, 4s.; mild white Natalino, 1859, 2s. 6d.; bitter white ditto, 1859, 2s.; Barbera, 1859, 1s. 9d.; ditto, 1861 and 1863, 1s. 6d.; dry Barbera, 1861, 1s. 6d.; Grignolino and pale ditto, 1861 and 1863, 1s. 6d.; Nebbiolo, 1859 and 1862, 1s. 9d.; ditto, 1863 and 1864, 1s. 6d.; Barolo, 1861; Tokay, 1861; Brachetto, 1861; white Strevi Muscat, 1861; bitter Muscat, 1863; white muscat, 1864; white Malmsey, 1864; Pasaretta, 1864; all 1s. 6d. M., Florence, 1861; M., London, 1862; M., Turin, 1864.
- 21 OGDART, LEIGH, wine grower and merchant, *Neive (Cone) and Grato*.—Red wines:—Neive, 1863, 1s.; Barolo, 1862, 1s. 6d.; Barbera, 1861; 1s. 6d.; dry Neive, 1861, 1s. 6d.; Nebbiolo, 1859, 2s.; ditto, 1858, 2s. 6d.; Nebbiolo and Pollenzo, 1844, 2s. 6d.; Pignolo, 1861, 1s. 6d.; Grignolino, 1863, 1s. 6d.; Nerano, 1853, 2s. White wines:—Dry Neive, 1862, 1s.; dry Nebbiolo, 1862, 2s.; Cortese, 1861, 2s.; sweet Nebbiolo, 1861, 2s. 6d.; Barbera and Malmsey, 1861, 2s.; Nerano, 1847, 3s.; Malmsey, Grinzane Cortese, and Nebbiolo, of 1847, 3s. Sparkling wines:—Barbera of 1861; Cortese of 1862; Nebbiolo and Pignolo of 1863, all 3s. per bottle. M., Florence, 1861; M., London, 1862.
- 22 NERUCCI, GHERARDO, wine grower, *Montale (Florence)*.—White wine, known as *Acqua della Scola*, 1862, 2s. 6d.; red Angelico, 1861, 2s. 6d. M., Florence, 1861.
- 23 OENOLOGICAL SOCIETY OF SAVIGLIANO (Cone).—Barbera, light Caluso, Asti Claret, Barolo, and Asti Malmsey, vintage 1864, all 1s. 9d. per bottle.
- 24 BLASI, GIOVANNI, wine merchant, *Velletri (Rome)*.—Common white wine and red, 1864, 1s. 6d.
- 25 POGGIOLI, LEONICO, *Grottaferrata (Rome)*.—Common red wine, 1864, 1s. 6d.
- 26 GALASSINI, FIO, *Marino (Rome)*.—Sparkling white wine, 1862, 3s.; Muscat, 1864, 2s.; common wine, 1863, 2s.
- 27 GRATIOSI, CHEV. GIOVANNI, *Velletri (Rome)*.—
- Wine from Spanish grapes, and Cesena wine, of 1864, 1s. 6d.
- 28 FRULANI, CARLO, *Grottaferrata (Rome)*.—Aleatico, 1864, 1s. 6d.
- 29 ANTONI, GIACOMO, *Bongonaro (Piacenza)*.—Common white and red wine, of 1864, 1s.
- 30 VEGLIO, LUIGI, *Serrafunga (Cone)*.—Red Nebbiolo, 1863 and 1864, 1s. 6d.
- 31 GREGO CARMA, CHEV. LEIGI, *Syracuse (Nato)*.—Dry white Albarello, sweet white Naccarella, 1863, 1s. 6d. M., Florence, 1864; M., Turin, 1864.
- 32 FLORIO, I. E. V. & Co., wine manufacturers (*Palermo*).—London Marsala; superior old Marsala. M., Florence, 1861.
- 33 TARDITI & SON, wine merchants, *La Morra (Cone)*.—White Nascette, 1863 and 1864, 1s.; bitter red Nebbiolo, 1864, 1s.; Vermouth, 1s. 6d.
- 34 MORANDO, GIOVANNI, *Asi (Alessandria)*.—Barbera, 1862 and 1863, 1s.; Brachetto, 1861, 1s. 6d.; ditto, 1862 and 1863, 1s. 3d.; white Muscat, 1859, 1s. 6d.; 1862 and 1863, 1s. 3d.; red Muscat, 1858, 1s. 6d.; ditto, 1863, 1s. 3d.; Tokay, 1860 and 1863, 1s. 6d.; Nebbiolo, 1861 and 1862, 1s. 6d.; dry Nebbiolo, 1863, 1s. 6d.; Grignolino, 1862, and dry ditto, 1863, 1s. 3d.; Malmsey, 1863, 1s. 3d.; Barolo, 1863, 1s. 3d.; Pasaretta, 1862 and 1863, 1s. 6d.
- 35 CHIARAMELLO, LUIGI, manufacturers of liqueurs, *Savigliano (Cone)*.—Stomachic elixir.
- 36 GROCCHI, CESARE, *Forlì (Ravenna)*.—Red Sangiovese vintages 1860, 1861, 1862, 1863, 1s. 9d. per bottle.
- 37 GUARNASCHELLI, G. *Broni (Paria)*.—Red wine, 1863 and 1864; dry ditto, 1863, 1s. 3d. per bottle; Aleatico, 1858; Muscat, 1863; Santo, or raisin wine, and Bordeaux, 1862, 2s. 6d. per bottle.
- 38 BOCCA, CARLO, *Alba (Cone)*.—Dry and sweet Nebbiolo, 1863 and 1864, 1s. 6d.; white Barbera, 1858, 2s. 6d.; white Barbaresco, 1860, 2s. 6d. M., Florence, 1861; M., Turin, 1864.
- 39 LANZA, DR. LORENZO, *Silvano d'Orba (Alessandria)*.—Dry bitter Dolcetto, 1861, 1s. 3d.; of 1863, 1s.; dry Cyprus, 1859, 2s. 6d.; white muscat, 1860, 2s.
- 40 DI FARQUALE, FELIPPO, *Lipera (Messina)*.—Malmsey, 1860 and 1861, 2s.; ditto, 1863, 1s. 6d.; white wine, 1860, 1861, 1s. 6d.; ditto, 1863, 1s. 3d.; red wine, 1860, 1s. 6d.; ditto, 1863, 1s. 3d. M., Florence, 1861; M., Turin, 1864.
- 41 FARELLA, GIUSEPPE, *Cagliari*.—Red wine, 1867, 1s. 6d.
- 42 VICOUNTE DI FLUMINI, *Cagliari*.—Nasco, 1s. 6d.
- 43 FOLIA, GIUSEPPE ANTONIO, *Bosa (Cagliari)*.—White Torbato, 1864, 1s. 6d.; red Giro, 1864, 1s. 6d.; white Malmsey, 1864, 2s.
- 44 COPPA, EMILIO, *Santangelo (Abruzzo Ultra I.)*.—White wine, 1864, 1s. 9d.
- 45 SCALERA, GIUSEPPE, *Terlizzi (Terra di Bari)*.—Sostato, 1864, 2s.
- 46 DE SAVIO, GIUSEPPE, *Terlizzi (Terra di Bari)*.—Zagarese, 1855, and Aleatico, 1858, 2s. M. Turin, 1864.
- 47 GUASTAMACCHIA, GIOACHINO, *Terlizzi (Terra di Bari)*.—Red wine and Zagarese, of 1862, 1s. 9d.; Aleatico, 1857, 2s. M., Florence, 1861; M., Turin, 1864.
- 48 SPALAZZI, FRANCESCO, *Lovina (Ancona)*.—Sweet Balsamino, 2s.; common dry do., 1s. 6d.; dry Balsamino, 2s.; best Lacrima, 2s.; all of 1863. M., Florence, 1861; M., Turin, 1864.
- 49 OGGERO, GIUSEPPE, *Fianova (Livorno)*.—Aleatico, Biancone, red wine and Riminese, of 1863, 1s. M., Turin, 1864.
- The Royal Oenological Commission exhibits collectively, wine made by forty-nine proprietors, viz.:—

Province	No. of Samples
Abruzzo Ultra I.	2
Alessandria	102
Ancona	4
Cagliari	8

Province.	No. of Samples
Coni, . . . . .	53
Forli, . . . . .	4
Florence, . . . . .	2
Genoa, . . . . .	4
Leghorn, . . . . .	4
Messina, . . . . .	8
Naples, . . . . .	2
Noto, . . . . .	2
Palermo, . . . . .	2
Pavia, . . . . .	30
Placenza, . . . . .	8
Ravenna, . . . . .	5
Rome, . . . . .	9
Terra di Bari, . . . . .	6
Turin, . . . . .	18

Although only nineteen provinces out of fifty-nine are represented, the collection contains a type of the principal wines drunk at the tables of the wealthy and the homely board of their less opulent neighbours; dry white wines, red table wines, full-bodied red wine, white and red sweet and sparkling varieties; each sample being labelled with the price at which it is obtainable on the spot. Some of the most important of the exhibitors are the following:—

Count Della Torre, who was awarded the prize and gained much commendation at the National Exhibition of wine held at Turin in 1864, as offering the best of those made at Caluso. The wines of this exhibitor are made of *erbaluce* and *pelleverde* grapes. They are somewhat analogous to Frontignan and Lunel, but have more body and a different aroma. At present they are sold at a very high price, but there is reason to believe that shortly the proprietors, profiting by the increasing favour which they find, will cultivate them on a more extensive scale, so that the prices will fall proportionably.

Eusebio Buelli, of Bobbio—a district which belonged to the late Kingdom of Sardinia, but was annexed in 1859 to the Province of Pavia—exhibits a variety of wines made from vines cultivated by himself, the greater part of which are foreign, as the very names themselves will show. He sells annually about 12,000 bottles of wine, carrying on his business with increasing diligence and success; his white wines, however, are more highly thought of than the red.

Count Manfredo Bertone di Sambuy is extending his vineyards yearly more and more in the vast champaign in which the battle of Marengo was fought sixty-five years ago, and where both climate and soil combine favourably to the production of excellent wines of various kinds. The vines have been brought partly from France and partly from the Rhine; others are indigenous. The exhibitor is turning his attention to the study of the particular variety of vines for which the soil is best adapted. The Marengo wine made with Bordeaux vines, Neretto, Cortese and Malmsey were most approved of at the Turin Exhibition of 1864.

Francesco Varvello purchases grapes grown in the Province of Alexandria, as well as in the Langhe Province of Coni. He stands first in importance of all manufacturers in the kingdom as regards quantity produced; his wine has received prizes at nearly all the Exhibitions lately held.

Chev. Luigi Ondart has large stores in Genoa, though he manufactures his wine at Neive in the Langhe (*Coni*), where he purchases the grapes. The collection of this manufacturer was considered equal to that of any other represented at the Turin Exhibition of 1864. The grapes he employs for the red wines are Nebbiolo, Nerano, and Barbera, and for the white Malvasia, Cortese, and *Pignolo*—all indigenous.

The wines of several other manufacturers were also much approved of, at the Turin Wine Exhibition, both for their taste and wholesomeness. Some of these may be regarded as types of special cultivation, and could they once be made known would find general favour abroad, especially the white Muscat from Cassine, the Vesuvian Lacrima, and the Nebbiolo from various

localities. Those of Lipari, Terlizzi, and Messina are also not less important. The better class of Italian wines are not always obtainable in barrels, but must be purchased in bottles. Several, however, of the kinds specified in this list may be had in barrels, and very cheap, such as the Barbera, Grignolino, Bracchetto, Nebbiolo, Neretto, and other wines made of red and green grapes at Barolo, Ghemme, in the Langhe, the Valtellina, the Upper Valley of the Tanaro, at Marengo, Broglio, and in Southern Italy, at Catania near Vesuvius, and in the vicinity of Marsala. The Piedmontese wines just specified cost from 36s. to 75s. per barrel of 22½ gallons, exclusive of carriage.—DB. G. B. PANIZZARDI.

146 ROYAL TOBACCO MANUFACTORY, Bologna.—(Tariff, according to the latest Ministerial decree of November 24th, 1864):—

	per lb.	per cwt.
	s. d.	£ s. d.
Snuff—		
Best Paris rappee,	3 9	21 3 6
Best Dutch rappee,		
Best St. Vincent rappee,	2 9	15 8 10
Fermented snuff,		
Natural rappee,	1 5	7 14 5
Jegedin rappee,		
Scaglioletta snuff,		
Niolet snuff, . . .		
Cut tobacco—		
Select wild tobacco,	3 9	21 3 6
Best wild tobacco,	2 9	15 8 10
Best strong tobacco,		
Cut tobacco, . . .	1 9	9 15 2
Cigars—		
Superior Havannah cigars,	10 9	58 0 0
Selected Roman cigars,	6 9	38 13 8
Moro cigars . . .	4 11	27 0 10
Virginian cigars		
Pressed Vevey cigars,	3 6	19 6 6
Long Vevey cigars,		
Strong short cigars,		
Mild short cigars,		

M., London, 1862; M., Dublin, 1865.

This establishment gives employment to at least 1800 persons, but the quantity of snuff and cigars manufactured has considerably decreased since 1864, owing to the greatly augmented prices affixed by the Government.

147 ROYAL TOBACCO MANUFACTORY, Lucca.—Prices same as above. M., Florence, 1861; H. M., London, 1862; M., Dublin, 1865. Tobacco is the most important article of manufacture at Lucca, and its preparation gives occupation to the most numerous and poorest part of the population, especially to females.

During the rule of the Bourbons this manufactory, providing solely for the wants of a miniature duchy, was naturally of secondary importance, and it only began to grow under the Lorrain dynasty after the annexation of Lucca to the grand duchy of Tuscany, when it was farmed by the prior Emanuele Fenzi of Florence. This establishment then began to improve, as it has ever since continued to do, although smuggling was extensively carried on under the late Government. The following table will show the recent development of the production compared with that under the Bourbons in 1847 and the Grand Duke in 1859, the last years of their respective reigns:—

Operatives	1847	1859	1861	1863
Men and women at fixed wages, . . .	15	35	47	11
Men and women paid by the day, . . .	20	57	95	112
Females paid by contract, . . .	82	642	652	890
Total number . . .	130	764	794	1013*

\* Of whom only 87 are males.

Mean monthly wages: men and boys, £3; females, £1 10s.; pay of day labourers, men and boys, 1s. 8d.; females, 10d. Females working by contract earn a mean of 10d. in 9 hours.

Quantity of Tobacco and Cigars manufactured.

	1847 Tons	1859 Tons	1863 Tons	Source of the Product
Rapeseed oil	20	100	180	Paris, Pizzichimo, Albania, Nobile and Macubino rapeseed.
Cut tobacco	10	70	80	Best and common tobacco.
Cigars	160	280	600	The most esteemed being the long and pressed Vevys.
Total	180	450	860	

	1859.	1863.
Produce of sale, -	£174,480	£288,280
Cost of manufacture, -	25,410	128,000
Net profits, -	£79,464	£160,280

The net profits of this manufacture being so considerable, the Chamber of Commerce requested the Government to permit its extension, in order to be able to satisfy the demands from all parts of the kingdom, which it is impossible to do at present on account of the small number of hands employed.

148 RUGGIERI, Canon GIOVANNI, grower, Terlizzi (Terra di Bari).—Malmsley or Malvasia wine, common wine.

149 SAVORINI, FRANCESCO and SON, manufacturers, Pernice, Bologna.—Bordeaux Asinella rosolio and white wine.

150 SCALESE, PASQUALE, 1 Strada Bartolomeo, Naples.—Red Frosida wine; Sicilian Muscat.

151 SCISCI, MICHELE, Giovinazzo (Terra di Bari).—Sweet almonds. Price, £2 16s. per cwt. H. M., Dublin, 1865.

152 SCOCCHERA, RAYNO, grower and manufacturer, Canosa (Terra di Bari).—Olive oil, of 1863 and 1864, produced at Canosa. M., London, 1862.

153 SCUDERI, FRANCESCO MARIA & SON, Catania.—Wine grown at Mezzo Campo, Terreforti, near Catania, vintages of 1860, 1861, 1862, 1863. M., Florence, 1861.

154 SIRIGU, GIUSEPPE, Cagliari.—Vermouth.

155 STOLZ LADINI, Cleo. VINCENTO, senator, producer (Bitonto, Terra di Bari).—Sweet Zagaraese; sweet Muscat; and common red wine. M., London. Raisins; almonds, 10 varieties. Price, £2 16s. cwt.

156 TORO, BENIAMINO and SON, manufacturers, Tocco di Casauria (Abruzzo Citeriore).—Strong and mild Centerba. H. M., Dublin, 1865.

The strong centerba is an excellent stomachic, and besides its medicinal properties when taken inwardly is very useful when applied externally for cuts and wounds. The mild kind is a delicious liqueur. Both are distilled from aromatic herbs growing on the Majella mountains, a spur of the Apennines facing the Adriatic, and in the province of Abruzzo Citeriore. Annual production several thousand bottles.

159 TUSCHARELLI, MICHELE, Casale (Capitanata).—Olive oil.

159 VANNUCCI, VANNUCCI, Florence.—Best and common oil of 1864, from the farm of Varna, Montajona, in the Val d'Elsa (Florence). Price 10d. per bottle.

160 ZANETTI, GUIDO, manufacturer, Bologna.—Bologna and soft sausages.

161 ZIRILLI, GIUSEPPE and SON, Milazzo (Messina).—Various wines:—

PRICES CURRENT OF ZIRILLI AND SON'S WINES DELIVERED AT THE PORT OF MILAZZO.

NAME OF WINE		IN BARRICA				IN CASES OF 24 BOTTLES		
		Five of 137 gallons, or 470 litres, about	Half-ripe, 54 gal.	1 Pipe, 39 gal.	1 Pipe, 14 gal.	Of 120 also	Of 1 Pipe	Of 1 Pipe
Port, -	1860	12 16	9 0	3 15	2 0	1 10	1 5	1 2
Bordeaux, -	1862	11 4	6 2	3 8	1 16	1 6	1 3	0 19
Mamertino, -	1858	18 0	8 10	4 10	2 8	1 15	1 10	1 4
Milazzo, -	1858	20 0	10 10	5 10	2 17	2 4	1 8	1 16
White ditto, -	1832	20 0	10 10	5 10	2 17	3 4	2 15	2 4
S. Domenico, -	1828	11 4	6 2	3 8	1 16	1 6	1 3	0 19
Amarena, -	1862	11 4	6 2	3 8	1 16	5 4	4 8	3 12
Calabrese, -	1861	16 0	8 10	4 10	2 8	1 14	1 10	1 5
Malmsley, -	1862	19 4	10 2	5 4	2 16	1 16	1 11	1 7
White, -	1856	22 8	11 15	6 2	3 4	2 12	2 4	1 18
Muscat, -	1856	22 8	11 15	6 2	3 4	2 12	2 4	1 18
Marsala, -	1860	13 12	11 6	3 18	2 2	1 12	1 7	1 3

The exhibitors' vineyards are situated close to Milazzo, either in the plain or gently undulating ground. The wines are made with the greatest care, well bottled and corked, with the addition of a metallic capsule, and stored for years with every precaution. The prices are reasonable, but the bottles are rather small.

These wines are stated to be perfectly pure, very digestive, improving by a sea voyage and by time, as the colouring matter separates and sinks to the bottom. Thus, the wines which at first were dark red in process of time become white. This will become evident on examination of the sample of S. Domenico, of 1828, the Milazzo of 1852, as well as the Mamertino, Calabrese,

Amarena and Marsala, all of which have become more or less white. The process of clarification proceeds more rapidly in bottles than in casks, and is most perfect in small bottles. In order to expedite it they should be hermetically closed, and constantly exposed to a cool current of air.

162 BONANNO, FRANCESCO, Palermo.—Olive oil from Termini Imerese.

163 BOTI, ALESSANDRO, Chiavari (Genoa).—Olive oil. M., London, 1862; M., Dublin, 1865.

164 CAFISI, MARCO STEFANO, Favara (Siracusa).—Wines of 1861, 1863, and 1864; oranges and lemons.

165 FAVARA, VERDIRAME VITO, Mazzara del Vallo

(*Tropani*).—Common wines; *Amarone*; Port; *Cedra-to*; Malaga, &c. M., Florence, 1861; H. M., London, 1862. Annual production, about 50,000 gallons.

166 FORESI, JACOPO, *Portoferraio, Elba (Leghorn)*.—Occhio di Pernice wine. M. Turin, 1864.

167 MININNI, IGNAZIO, *Polo del Colle (Terra di Bari)*.—Common red and sparkling wine.

168 MASTROGIACOMO, SAVERIO, *Noicattaro (Terra di Bari)*.—Fine olive oil.

169 RICABOLI, BARON BETTINO, *Florence*.—Broglio wine; olive oil; cheese. M., London, 1862; M., Turin, 1864; M., Dublin, 1865.

170 RACAGNI, BERNARDO, *Brescia*.—Large collection of samples of Indian corn, classified and named. M., Dublin, 1865.

#### FOOD PRODUCTS EXHIBITED FROM THE PROVINCE OF MODENA.

**Wine.**—The province furnishes a considerable quantity of grapes. Of late years, during the prevalence of the wine disease in Lombardy and Tuscany, Modenese wines, although common, were largely sent to those provinces; but for the last two years, since the disease has abated, it has been found more difficult to sell common wines, which has resulted in an improvement of the system of manufacture. Experience has proved that wine can be made very economically from the grapes grown in this province, fit to bear a sea voyage, and possessing excellent stomachic properties. In many of the large cities of the kingdom, Modenese *Lambrusco* has begun to find favour, a considerable quantity of it being sold in barrels and bottles at from 3s. 6d. to 7s. per gallon. Modenese wines were well represented at the Italian Exhibition in 1861, and at the London International Exhibition of 1862, on both of which occasions they gained several prizes.

**Liqueurs.**—The manufacture of rectified spirits has assumed considerable importance throughout Europe, every country having its own particular varieties, known in commerce and by connoisseurs by the name of the town from whence they come. Fortunately, the taste for intoxicating drinks is losing ground, to be more and more replaced by the use of liqueurs, not less agreeable to the palate and far more harmless to the stomach. The Modenese *Rinfresco* precisely combines these qualities. It is made in several parts of the province, and is in much repute in the neighbouring part of Italy. The spirit employed comes from Rhenish Prussia, as this appears to be the cheapest and most adapted to the purpose. The *Rinfresco* costs from 5s. 9d. to 6s. 9d. per gallon; thus it is much cheaper than Bordeaux anisette, a liqueur to which it bears a close resemblance.

**Vinegar.**—Two kinds of vinegar were represented at the Dublin Exhibition, the common and the balsamic. Both are made from the boiled must of grapes, subsequently placed in vessels which have already served for that purpose.

Those who manufacture vinegar on a large scale possess well-ventilated, sunny apartments, in which there is a series of vessels of vinegar arranged chronologically. The contents of these vessels diminishes about a third every year, and the deficiency is made up from the adjoining one of the following season, beginning at the oldest vinegar and proceeding regularly to the newest. At the end of three, seven, or even ten years the common vinegar is fit to drink, and is sold at an average price of 18s. per gallon.

When the vinegar is of a certain age it acquires a high value from the expense and care necessary in its preparation. The vessels containing the old vinegar become sufficiently porous to allow a certain quantity to pass through their substance, rendering it necessary to enclose them in a second outer vessel, which in process of time has likewise to be surrounded by a third one still larger.

Some families who have carried on this process of manufacture for a long time have vinegar of more than 150 years old. Of course they cannot sell much of this age, nor would it serve for domestic purposes, on

account of its great thickness; it is, however, used to give fragrance to vinegar of more recent manufacture, constituting the Modenese balsamic vinegar of commerce, which sells for 36s. per gallon.

**Sausages.**—These form an important article of trade with neighbouring provinces, and even of exportation. They range in price from 9d. to 1s. per lb.—FRANCESCO BORSARI.

#### SECTION IV.—VEGETABLE AND ANIMAL SUBSTANCES USED IN MANUFACTURES.

[Number of exhibitors, 35; exhibitors represented collectively, 35. Of these 5 obtained prize medals at the Italian Exhibition at Florence in 1861; 2 obtained prize medals and 1 an honourable mention at the International Exhibition in 1862; 40 obtained prize medals at the Turin National Cotton Exhibition in 1864; lastly, 5 received medals and 1 honourable mention at the Dublin International Exhibition in 1865.]

180 ALONZO, Chev. ANTONINO, *Catania*.—Raw Siamese cotton (*G. hirsutum L.*), grown on the estate of Finocchiaro, at Belpasso (*Catania*), crop of 1864. Price 14½d. per lb. The same cotton, cleaned with the mangello and subsequently bowed. Price 8s. per lb. M., Turin, 1864.

181 ASTENGO BROTHERS, late LUIGI, manufacturers, *Savona (Genoa)*.—Soap. Price 4½d. per lb.

182 ASTENGO BROTHERS, late VINCENZO, *Savona (Genoa)*.—Manufactured wax. Price 2s. 6d. per lb. M., Florence, 1861.

183 BACCINI, GIOVANNI, broom manufacturer, *Lastro a Signa, and Florence*.—Rush carpet and other brooms. H. M., London, 1862; H. M., Dublin, 1865.

184 BELTRANI, GIUSEPPE, producer, *Trani (Terra di Bari)*.—Cotton grown at Trani, crop of 1864.

185 BOLOGNA HEMP SPINNING WORKS, RAFFAELE RIZZOLI, Director, *Bologna*.—Raw, combed, and spun Bolognese hemp. M., Florence, 1861.

This Company was founded in 1851, but did not assume its present extent until 1858. It consists of 212 shares of £200 each, forming a capital of £42,400. The manufactory is situated at Casalecchio di Reno, two miles out of the city, and is managed by Mr. Sutton, an Englishman of much experience.

There are 4,256 spindles; 800 tons of raw hemp, worth about £27,000, are annually spun, producing 300 tons of best yarn, numbers 10 to 20, sold at from 18d. to 22d. per lb., and 360 tons of common yarn, selling at from 13d. to 18d. The manufactory gives employment to 370 persons of both sexes, including 300 adults, and 70 children from 10 to 14 years of age. There are 3 turbines, set in motion by a fall of water 15 feet high, and having a power of 250 horses. As water is scarce in Summer, there are two auxiliary steam engines, having an aggregate power of 180 horses.

186 CATANIA SUB-COMMITTEE FOR THE DUBLIN INTERNATIONAL EXHIBITION.—Raw herbaceous cotton (*Gossypium herbaceum*), crop of 1864, grown at Dorillo (*Nota*). The same cotton, samples ginned by various machines. Six half-tanned lamb-skins, prepared in the German manner with bran and salt. Price per 1,000 skins, £46. Black lamb-skins prepared with alum; £50 per 1,000 skins. Two dried wild cat-skins, natives of Sicily; £6 per 100. Two native Sicilian fox-skins, dried; £8 10s. per 100. Six raw native white goat-skins; £88 per 1,000. Three dried raw black lamb-skins, and two dried white do.; £45 per 1,000.

187 CHICCA, RAFFAELE & Co. *Lucra*.—Castor oil; raw and boiled linseed oil; ditto for varnish.

188 COMPAGNA, BARON LUIGI, *Corigliano (Calabria, Citeriore)*.—Raw Siamese cotton, crop of 1864; the same, cleaned with Platt's gin. M., Turin, 1864.

Cotton has long been acclimatized in Calabria. The ground is let out to the peasants as in Tuscany by the plan known as *Mezzadria*, that is to say, the tenant supplies the labour, the landowner the rest, and they divide the profits at the end of the season.

At the close of 1864 about 100 acres were set apart for sowing with cotton in the Spring; the ground was four times ploughed, and as often hoed, and irrigated according to the nature of the soil.

Baron Compagna has set up four of Platt's Macarthy gins for cleaning his cotton in an improved manner, and an hydraulic press for packing it.

**189 DI BENEDETTO, FRANCESCO & MOTTA, Catania.**—Green-seeded or Siamese cotton (*G. hirsutum*), crop of 1864, grown by the exhibitor at S. Alessio, near Catania, and cleaned with Platt's gin. Another sample, grown at Riesi (*Caltanissetta*), and cleaned with the *manganello*.

**190 DILG, EDOARDO & Co. Comiso (Catania).**—White-seeded or herbaceous cotton (*G. herbaceum* L.), commercially known as "Terranova cotton," cleaned with Dobson and Barlow's Macarthy gin; seeds obtained by ginning the above sample. Price of the cotton, 9½d. per lb.; of the seeds, 1s. 7d. per cwt.

**191 DONNAFUGATA, Baron FRANCESCO MARIA AREZZO, (Ragusa Noto).**—Cotton grown at Passolato, Ragusa, in the pod and cleaned; Egyptian cotton, 2 samples; Louisiana cotton; New Orleans cotton, 3 samples; white hirsute cotton. M., Dublin, 1865.

**192 DUTTO, GIUSEPPE, manufacturer, Coni.**—Wax tapers; price 3s. per lb. M., Florence, 1861.

These tapers are manufactured with Turkey wax, bleached and prepared by steam. There are 2 boilers, working up to a pressure of 9 atmospheres, and serving to heat these recipients, 6 double pans, a large bath, 2 round baths, &c. There are 12 workmen employed in the manufactory. Annual produce 70 tons of wax tapers.

**193 FENZI, EMANUELE ORAZIO, Florence.**—Straw for plaiting.

**194 HALLAIRE, EUGENIO, bailiff on the estate of H. M. the Emperor Napoleon III., Civitanova (Macerata).**—Samples of cotton, crop of 1864. Cultivation carried on on a large scale:—Sea Island cotton, from seeds of last crop grown at Civitanova; Louisiana cotton, ditto; Georgia cotton, seeds obtained from Africa; Jumel cotton, seeds obtained from Egypt.

Experimental cultivation:—Georgia cotton, from seeds of last crop grown at Civitanova; upland cotton, seeds obtained from America; Louisiana cotton, seeds obtained from the Royal Commission for the Cultivation of Cotton in Italy; New Orleans cotton, seeds presented by the Manchester Cotton Supply Association; American cotton, ditto. M., Turin, 1864; M., Dublin, 1865.

An experimental cultivation carried on at Civitanova of late years, close to the sea coast, the exhibitor having been the first to introduce cotton farming into this province.

Madder roots, third season of cultivation; roots procured from France in 1862.

**195 LAGORIO, Chev. ANTONIO, Bologna.**—Raw hemp, grown at Viadagola. Hemp is the staple produce of the Bolognese plains, not less than 8,000 tons being produced annually. The sample sent to Dublin represents the mean quality. Most of it is exported in the raw state, and sells at from £3 12s. to £4 per cwt. A small quantity is dressed, spun, and woven, at Bologna.

**196 MAJORANA BROTHERS, SALVADORE & GIUSEPPE, Barons of Nicchiara, Catania.**—Raw green seed, or Siamese cotton (*Gossypium hirsutum*), grown on the exhibitors' estate of Troldo, at Lentini; the same cotton, cleaned by various gins; buff coloured cotton (*G. hirsutum, land rufd*), grown on the exhibitors' estate of Troldo; the same cotton cleaned by various gins.

M., Florence, 1861; M., London, 1862; M., Turin, 1864; M., Dublin, 1865.

Price per cwt.

Flax, grown in 1864 on the estate of Troldo, £3 5 6

1. Shumac leaves (*Rhus Coriaria*), from the estate of Nicchiara, territory of Mineo (Catania), 1864, 0 4 4

2. Ground shumac (same as No. 1), known as *occhio di pernice*, or pheasant's eye shumac, 0 6 0

Price per cwt.

3. Superfine ground shumac from the estate of Nicchiara, 1864, £0 8 8

4. Do., known as *macina fina*, or finely ground shumac, 0 7 8

M. Florence, 1861; M., London, 1862.

Cork, two samples, grown on the estate of Rigolo, territory of Buccheri, 0 13 0

Virgin wax, produced on the estate of Nicchiara, 11 15 0

M., Florence, 1861.

**197 MODENA BROTHERS, CESARE and ISAIA, brush manufacturers, Reggio in the Emilia.**—Roots of the *Chrysomelid* *Gryllus*, for making brushes; price 1s. per lb.

**198 MUNDI, GIOSUE, Bari.**—Louisiana cotton; New Orleans cotton; African cotton; Egyptian cotton.

**199 PADOLECCHIA, NICOLA, Bari.**—Raw cotton.

**200 PERATONER & Co., merchants, Catania.**—White-seeded, or herbaceous cotton (*G. herbaceum* L.), grown at Terranova (*Caltanissetta*), crop of 1864, cleaned; green-seeded or Siamese cotton (*G. hirsutum*), grown at Biancavilla (*Catania*), crop of 1864, ginned; raw white-seeded or herbaceous cotton, grown at Terranova, crop of 1864; green-seeded or Siamese cotton, grown at Agosta (*Noto*), cleaned with the common wooden *manganello*. M., Turin, 1864. Ground shumac, season 1864; 6s. 9d. per cwt.

**201 PIZZETTI, FERDINANDO, Parma.**—Parmesan silkworm cocoons; Macedonia and Bucharest cocoons reared in Parma; eggs in moss of the above silkworms. M., Dublin, 1865.

**202 RICASOLI, Chev. Colonel VINCENZO, grower, Florence.**—Siamese cotton grown at Cala Sgalera, near Port Ercole, on the Mont'Argentario (*Grosseto*). M., Turin, 1864. Extent of ground cultivated in 1864, 37 acres.

**203 ROYAL ECONOMICAL SOCIETY.**—Foggia (*Capitanata*).—Wild madder roots; Louisiana cotton in pods, grown at Foggia in the Botanical Gardens of the Society.

**204 ROYAL INDUSTRIAL MUSEUM, Comm. G. DE VINCENTI, Director, Turin.**—Collection of samples of Italian cotton, crop of 1863, already exhibited at the first Cotton Exhibition held in the Industrial Museum in 1864. M., Dublin, 1865.

*Northern Region.*—The cotton plant has flowered and even produced ripe cotton in the provinces of Turin, Milan, and Venice, within sight of the snow-clad Alps; but though the Summer heat is intense, it commences late, and the total amount during the season is insufficient for the plant, which is too delicate to stand the least frost, and this comes on before the cotton has ripened. The climate of the plains of the Emilia between Placenza, Ferrara, and Bologna is nearly the same as in those of Piedmont and Lombardy, though the Winters are less severe. The western slopes of the Apennines, known as Liguria, and embracing the delightful tract commencing near Nice, and extending towards Chiavari and Spezia, has a climate which would be mild enough for the cotton plant in Winter, but there is scarcely an acre of level or irrigable land, as the sea bathes the foot of the mountains. Hence, however interesting to botanists or country gentlemen, the cultivation of cotton ought not to be encouraged here as a speculation. This will sufficiently explain why no samples were sent to Dublin.

*Central Mainland Region.*—In this region the cotton plant comes to perfection, though it is an open question how far it can be now grown profitably. Frosts come on much later here than in the north, and owing to the entire absence of lofty chains of mountains the Winters are milder, while the rivers, rising in the region itself, supply water of a higher temperature for irrigatory purposes than the Alpine feeders of the Po; and the Mediterranean, which may be described as an enormous evaporating pan so charged with saline particles that these are carried up by the wind and deposited in a moist form on the leaves for miles from the coast, which is doubtless a very favourable condition to the growth of the cotton plant.

*Central Insular Region.—Sardinia.*—The plains on the South of the Island of Sardinia seem excellently adapted to the growth of cotton, especially the long staple kinds. The peasantry, however, are very tenacious of the traditional customs of their ancestors, and extremely jealous of any labourers coming to work in the island, although they themselves are far from active, so that up to the present time the price of labour has been kept up excessively high. In Summer time the plains, where alone the cotton plant can grow, are so unhealthy that it is not safe for a stranger to remain there.

*Southern Mainland Region.*—Cotton has been cultivated with success in the Neapolitan provinces for upwards of fifty years, if not more. The chief centres of its growth may be taken as Castellamare, Salerno, Bari, Rossano, Corigliano, &c., all in plains bordering on the coast. The only two species sown up to lately were the herbaceous and the white and buff varieties of Siamese cotton.

During the time that France was at war with England and unable to receive her supplies from America, the quantity became sufficient to render it an article of export to Marseilles, but this fell off immediately after the peace, and has only resumed its importance during the last two years, through the labours of the Royal Commission for the cultivation of cotton. The quality of the staple is such as to have generally excited the admiration of the Manchester Cotton Supply Association, who consider that it should by all means become a steady article of production in normal times. The Association presented a quantity of New Orleans seed to the Royal Italian Commission at Dublin in the month of February, 1866, and it is hoped that this may tend considerably to improve the produce to be expected from Southern Italy this year, and encourage further purchase of the best American seed.

*Southern Insular Region.—Sicily.*—The chief seats of cotton farming in Sicily are on the east and south coast, in the provinces of Catania, Caltanissetta and Noto, and the towns of Biancavilla, Terranuova, Comisa, and Pachino may be taken as centres of cultivation. Several rich families having grown cotton for many years for local consumption, the plant is thoroughly known to the peasants, but up to the last two or three years the method of cleaning the cotton was of so primitive and barbarous a character that the staple was broken and the seeds were frequently crushed during the operation, so that the oil they contained stained and deteriorated the fibre. Two important points urgently demanded the interference of the Royal Commission for the cultivation of cotton—to recommend the use of good seed, especially American, and to show the absolute necessity of employing proper machinery. Both these have considerably improved, as may be judged by a comparison of the samples at the Dublin Exhibition with those sent to the International Exhibition of 1862. Comm. Devincenzi, Royal Commissioner for Italy, states, in a report printed in 1862, that many of the samples lost from a fourth to a third of their value by bad cleaning; this loss of value has probably already fallen in many cases to 5 per cent., at least with the produce of the most intelligent planters, and even this small loss may be attributed to the want of skill and ignorance of the peasants. There is every reason to believe that cotton could be grown in the plains of Sicily, the southern part of which has nearly the same climate as Algeria, even after the internal differences of the American people shall have sufficiently calmed down to permit them to turn their attention once more to planting cotton.

The Royal Commission for the cultivation of cotton, of which Comm. Devincenzi is president, was formed in Turin shortly after the close of the International Exhibition of 1862, for the purpose of proving to the farmers and proprietors of the southern provinces that climate, soil, and other circumstances all combined to favour the extensive growth of cotton, and that the high

prices then existing were a sufficient guarantee that the experiment could be carried on without fear of loss. Sub-committees were formed in the principal agricultural centres, to which seed was sent and all kinds of information afforded. The great proprietors and the most intelligent farmers took up the question, and it is to them we owe the development of the cultivation of this plant up to the present time. The Cotton Supply Association at Manchester afforded most material help in this arduous undertaking, as indeed it has done everywhere; and on the occasion of the first exhibition of cotton which was held in the Royal Industrial Museum at Turin at the commencement of the year 1864, the Association was represented by the President, Mr. John Cheetham, whose presence eloquently proved how the labours of the Commission were appreciated in England.—G. P. JERRIN.

205 RUDINI, Marquis ANTONIO, Palermo.—Siamese cotton, grown at Pachino (*Noto*). M., Turin, 1864.

The seeds of this variety originally came from Malta at the beginning of the present century, since which time the plant has been acclimatised in Sicily. The Marquis Rudini is probably the most extensive cotton grower in the whole of Italy, having devoted no less than 930 acres to its cultivation in 1864.

The soil at Pachino is volcanic and clayey, partly calcareous and partly alluvial. The exhibitor planted his cotton in two different ways, known as the "trench" and "plough" systems, of which it may be interesting to append a short account.

As soon as the Autumnal rains begin to set in the ground is ploughed two or three times, according to circumstances, but before the soil has become too moist; this operation is repeated several times until the month of March, taking advantage of the drier days, so that all the weeds may be thoroughly destroyed, which is rendered more certain by finally hoeing the ploughed surface.

No change has been made in the form of the plough used in Sicily since the time of the Romans; the depth reached by it is about a foot. The exhibitor has, however, introduced on his estates the plough with a "vol-torecchio" share, and also the harrow, and reports that he has found them very serviceable.

Having prepared the ground in the manner described, the cotton is sown about the middle of April. A third part of the seed is placed in water, and subsequently rubbed lightly with a mixture of pulverized sheep's dung and ashes, in order to strip it of the down still adhering after the operation of ginning. Two parallel furrows are made, between which the sower throws the cotton seed broadcast, as is practised for corn. Meanwhile, a boy who walks between the two ploughs throws into the furrows, at intervals of three feet, ten or a dozen dry seeds in addition to the former ones. The furrows are at once covered up by the ploughs which follow the sower. The expense of sowing comes to about 8s. 6d. per acre, 136 lbs of seed being employed for the purpose. Such is the method adopted in soil sufficiently tenacious to preserve the humidity essential to the germination of the seeds.

In drier and more porous volcanic soils, a different course is followed. At the end of April furrows are made, distant about 20 inches apart and 7 inches deep. The labourers having made the furrows, each provided with an earthen pot of water containing the seed, first water the furrows and then throw in the middle about 15 seeds, fixing them firmly in the ground by pressing them down with the back of the hand, and then covering them up with loose and moist earth. This method of sowing is more expensive than the former, costing 18s per acre, but it only requires 120 lbs. of seed.

When once the plants have come up, fresh seeds are sown wherever these are deficient, in all cases adopting the plan of making furrows, even in the fields sown in the first instance with the plough.

By the time the little plants have got four or six leaves they are thinned, leaving the strongest ones at

proper intervals in the field sowed by the plough method, and in the other case groups of three or four plants, and rooting out all the rest.

The cost of performing this work is about 2s. per acre; the plants are then hoed up three times at equal intervals of time until August, at a cost of 7s. 6d. per acre. The cotton begins to ripen in September, but on account of the frequency of the rains is not entirely gathered in before January. The cost of gathering is 2s. per cwt.

Irrigation has not hitherto been practised at Pachino, from the want of perennial springs, though now the Marquis Rudini has canalized the little river Randeci, and brought the water into his estate of Bimesca, so that he will in future be able to irrigate a large extent of land. The produce of raw cotton per acre in 1864 on this plan was about 175 lbs.

Ginning is usually performed at Pachino by the use of a rough wooden apparatus introduced by the Maltese colonists. As it naturally crushes many of the seeds and injures the cotton, the proprietor has purchased improved ginning machines, manufactured by Dobson and Barlow, Durand, and Platt and Co.

Formerly the ground now planted with cotton was sown with corn, grass, and leguminous plants, but although admirably adapted for this kind of cultivation, cotton, at the present prices, is far more profitable.

In the year 1864 the plants suffered very considerably from the ravages of an insect which in some districts entirely destroyed the crop. Various plans were resorted to in order to exterminate them. The plants were sprinkled with quicklime, sulphur and tobacco, but to no effect, the insect being in no way injured, but continuing its ravages as before.

**206 SARTORI, BIANCHI (heirs of), manufacturers, Borgo S. Giacomo, Parma.**—Wax; wax candles, 1s. 8d. to 2s. per lb.; black and red sealing wax, 2s. 9d. per lb. M., London, 1862; M., Dublin, 1865.

Manufactory established in 1810 and furnishing employment for 10 workmen at 15d. a day. The wax is drawn out into very long thin strips which can be readily bleached in the most uniform manner by the rays of the sun. It is melted in water baths and manufactured into candles and tapers for churches.

**207 TORNABESE, Prof. FRANCESCO, Director of the Botanic Gardens, Catania.**—One hundred and fifty-seven different samples of cotton grown in 1864 in the Botanic Gardens at Catania, labelled. Pods, and dry plants, together with a specification of the country from which the seeds were obtained, the botanical names and synonyms. M., Turin, 1861; M. Dublin, 1865.

The Director of the Botanical Gardens at Catania received some cotton seeds in 1862 from the Sicilian Agricultural and Farming Association, and the Prefect of the province, the following year, from the Sicilian Acclimatization Society; and early in 1863 these gardens were selected by the Royal Commission for the cultivation of cotton in Italy, at Turin, as one of the spots where the experimental cultivation should be carried on, requiring in return to have exact notices of the result obtained and the method of cultivation employed.

Numerous articles by the exhibitor appeared in the journal of the *Commissione di Agricoltura e Pastorizia* of Palermo, and in that of *Agricoltura, Arti e Commercio* of Bologna, in which the plan of cultivation is given in great detail, the causes of failure are noted, observations are made respecting the ginning by various machines, and the several species which are most advantageously grown in Italy. At the National Cotton Exhibition held in the Royal Industrial Museum in Turin in 1863, five species of cotton were exhibited by the writer as representing those which it appeared to him most desirable to encourage.

In 1864, 262 samples of cotton seed from numerous countries were sown in the Botanic Gardens. The produce of 157 of these were sent to the Dublin International Exhibition, as stated above, classified according to the countries, and named botanically. The exhibitor is now

preparing a monograph on the cotton plant, and defining the species more accurately than has been done hitherto.

The specimens exhibited comprised the following: Italy, 24 samples; Malta, 3; Turkey, 4; Greece, 1; Egypt, 1; Algeria, 36; India, 50; Asiatic Russia, 1; Portuguese colonies, 6; United States, 7; British Guiana, 5; Jamaica, 14; Brazil, 1; New South Wales, 7. Total, 157.—Prof. F. TORNABESE.

**209 VONWILLER, DAVID, and Co. manufacturers, Castellammare (Naples), and 69 Strada Cassanese, Napoli.**—Best gascine; 2nd quality ditto, common ditto; madder. M., Florence, 1861.

**210 CHEVAL, F. and ROSSI, G. Cagliari.**—Raw cotton.

**211 MURRU, ANTONIO, Cagliari.**—Raw cotton.

**212 PANTALEO, NICOLÒ, Bari.**—Raw Siamese cotton.

**213 PONTE, Chev. GASTANO, Palapozza (Catania).**—Raw cotton.

**214 CONSOLE, MICHELANGELO, Palermo.**—Twenty-six varieties of cotton seed mounted on a card, to show the relative and absolute length of the staple. M., Turin, 1864.

**215 LOFORTE, GIOVANNI, 41 Strada de Sette Dolori, Naples.**—Kid skins for gloves, £1 13s. 6d. per dozen. M., Dublin, 1865.

#### SECTION VII.—CIVIL ENGINEERING, ARCHITECTURAL AND BUILDING CONTRIVANCES.

[Number of exhibitors, 5. Of these 1 obtained an honourable mention at the Dublin International Exhibition of 1865.]

**239 DIRECTORS OF THE MONT-CENIS SUB-ALPINE TUNNEL, 2, via San Secondo, Turin.**—Topographical plan and vertical section of the Mont-Cenis, showing the course of the tunnel. Photographed by Chiapella, Turin, without enlargement.—(See also Section I., No. 3, p. 409).

**240 GENERAL COMPANY OF THE ITALIAN IRRIGATION CANALS (CAVOUR CANAL), 28 via della Spina, Turin.**—Seven photographic views, executed by Viard, of Turin, representing the state of the principal works on the Cavour Canal in November, 1864:—

- 1 Great flood-gate for the supply of water from the Po, near Chivasso (Turin). 2 Sluice-gate.
- 3 Portion of the canal, completed.
- 4 Aqueduct over the river Dora Baltea.
- 5 Draining operation, in order to obtain a foundation for the syphon under the Naviglio d'Ivrea.
- 6 Tunnel under the torrent Elvo.
- 7 Aqueduct over the torrent Cervo.
- 8 Curved aqueduct and bridge over the torrent Marchiazza. 9 and 10 Tunnels under the river Sesia.

Bird's eye view of the course of the Canal, in chromolithography. Longitudinal section of the Canal.

The construction of the Cavour Canal, one of the finest public works in Northern Italy, was planned by Carlo Nobè, C.E., of Turin, and conceded in 1862 to an English company. Its object is the irrigation of the eastern portion of the ancient kingdom of Piedmont, embracing the territory of Novara, Vercelli, and the Lomellina, a fertile district, famous for its rice fields. The supply of water is derived from the Po, near Chivasso, a few miles below Turin.

The concession is granted for 50 years, commencing from the 15th April immediately following the opening of the canal for irrigation purposes, and at the expiration of that period the whole property reverts to the Government, without any compensation to the Company. The irrigatory year is to be reckoned from one spring equinox to another. M. Oscar Aoli has written an excellent memoir on this subject, which appeared in the 25th volume of the *Politecnico* of Milan, from which we obtain the following data:—

The total length of the canal is 52 miles, and the height of the bed at the entrance gate at Chivasso 568 feet 6 inches above the level of the sea, while the waters

will be discharged into the Tessin at the level of 497 feet 6 inches, taking in like manner the bed of the works. If from the total length of the canal we deduct 1,275 feet, consisting of the horizontal tunnels, we have a mean fall of 1 in 3,780, although, of course, this is by no means constant, but on the contrary increases to 1 in 2,000 at the upper entrance and diminishes to 1 in 5,000 at the exit; the fall before reaching the aqueducts also exceeds the mean.

The canal at the bed entrance and for the first 2,280 feet is 182 feet in width, diminishing first to 98 feet, and at a distance of 27,870 feet to 65 feet in width, which dimension it preserves to 38 miles from the entrance, when it is once more narrowed to 41 feet, and finally to 24½. The normal width and fall are modified in passing through the syphons, in order to permit the easy flow of the water, after which they again resume their ordinary character.

The four principal aqueducts over water-courses present the following dimensions:—

DETAILS OF CONSTRUCTION	Name of Water-course spanned			
	Dora Baltea	Cervo	Rossanda	Marchizza
Number of arches,	9	7	3	3
	Ft. In.	Ft. In.	Ft. In.	Ft. In.
Chord of each arch,	52 6	49 2	29 6	15 9
Depth at keystone,	2 6	2 4	2 2	2 2
Depth of Water in aqueduct, -	11 2	10 6	10 6	10 6
Length of aqueduct,	631 6	492 0	171 0	102 0
Ditto upper approach,	745 0	669 0	262 0	230 0
Ditto lower embankment, -	6146 0	3256 0	1882 0	105 0

The four principal passages under the water courses crossed, offer the following details:—

DETAILS OF CONSTRUCTION	Name of Water-course crossed			
	Elvo	Seala	Agogna	Ter-doppio
Number of arches of 15ft. 6 inches span,	5	5	3	2
	Ft. In.	Ft. In.	Ft. In.	Ft. In.
Depth of Water in canal at entrance,	11 2	10 6	10 6	9 10
Depth of Water in canal at exit, -	8 2	8 6	8 10	9 2
Length of aqueduct along the water course, -	582 0	870 0	161 0	142 0

The works are being pushed on with great activity, so that in a short time the canal will be opened. In the most favourable season of the year 14,000 days' work is performed in twenty four hours, and the monthly expenses range from £100,000 to £120,000.

**241 UPPER ITALY RAILWAY COMPANY, via Cernaia, Turin.**—Collection of photographic views of the principal engineering and architectural works on the lines belonging to this company, taken by Messrs. Deroche and Heyland, photographers, 16, Corso Vittorio Emanuele, Milan.

**A Lombard lines.**

The Central Railway Station, Milan:—

- 1 General view.
- 2 Exterior view of the central hall.
- 3 The King's pavilion.
- 4 Exterior view of the iron roof.
- 5 Interior view of the iron roof. Span, 122 feet; length, 701 feet.
- 6 Interior of the grand hall.

7 Iron bridge, connecting different parts of the station. 2 arches span 60 feet; curvature 5 feet: and 1 arch span 75 feet; curvature 5 feet.

8 View of the largest arch mentioned.

9 Iron bridge over the Loreto road, Milan. Span 35 feet; depth at centre, 3 feet.

10 Viaduct of the Lazaret, Milan. 65 arches; span 14 feet. Total length, 1,246 feet.

Various points on the line:—

11 Viaduct of the Soma, between Bergamo and Lecco. Length 372 feet; greatest height 83 feet 6 inches.

12 Bridge over the Tessin, at Pavia. 5 elliptical arches; span 108 feet; height 30 feet 6 inches; depth at key-stone 3 feet 7 inches.

13 View of a single arch of the bridge over the Tessin.

14 Bridge over the Lambro, on the Milan and Placenza Railway. Span 84 feet; height 21 feet 9 inches; depth of key-stone 3 feet 7 inches.

15 Temporary wooden bridge at Placenza.

16 General view of the temporary wooden bridge over the Po at Placenza.

17 Permanent bridge over the Po at Placenza (now opened). State of the works in September, 1863.

**B Bologna and Pistoia line.**

Photographs taken by O. Galli.

18 View of Sasso.

19 Panico bridge over the Reno.

20 Tunnel of Calvenzano; southern entrance.

21 Vergato bridge over the Reno.

22 Malpasso bridge over the Reno.

23 Tunnel of Riola; southern entrance.

24 The Cassette bridge over the Reno.

25 Porretta station.

26 Tunnel of the Madonna della Porretta; southern entrance.

27 Tunnel of the Capanne; southern entrance.

28 Viaduct of Granaglione.

29 Bridge of the Pian di Reno.

30 Viaduct of Ombrone at S. Mommé.

31 Viaduct of Pitecchio. Length, 550 feet; height, 141 feet.

32 Bridges over the railway at Corsini and Selvaccia.

33 Viaduct of the Grazzini. 34 Panorama.

35 Bridge of the Gualbiera.

36 View of the bridge of Pian di Reno.

**242 THE MUNICIPALITY OF TURIN.**—The new Central Railway Terminus in Turin, designed and built by Chev. Mazzucchetti, from the architect's drawing. Photographed by Chiappella, Turin, without enlargement (albumen process). Photograph of the new front of the Palazzo Carignano, Turin, the present Chamber of Deputies.

**243 ZAPPA, LUIGI,** manufacturer of hydraulic machinery, 10, *Vicolo San Giovanni sul muro, Milan.*—Fire engine easily taken to pieces and put together again. Price £60. H. M., Dublin, 1865.

This engine contains 66 gallons of water, which it is capable of projecting 100 feet, at the rate of 40 gallons per minute, and requires 8 men to work it. It is provided with 6 hempen buckets, 31 yards of hempen hose, and a brass jet. The pattern is that adopted by the city of Milan.

Two improved brass valve taps for baths, not liable to leak (invented by exhibitor). Price £12.

## SECTION VIII.—NAVAL ARCHITECTURE, MILITARY ENGINEERING, AND ORD-NANCE.

[Number of exhibitors, 7. Of these 1 obtained a prize medal at the Italian Exhibition at Florence in 1861.]

**249 CASINI, AMBROGIO, Pietrasanta (Lucca).**—Damasked gun barrel. Price £8.

**250 LOMBARDO FIRE ARM MANUFACTORY (Fabbrica d'Armi, Lombarda), Cariglio, near Lecco (Como).** Office in Milan, 24, via S. Antonio.—Pig iron from Bondione, Schilpario, and Pisogne, Lombardy; two rods of

malleable iron; infantry musket, Italian model, 1860, complete, price £2; ditto, barrel only, 15s. 3d.; rifle Italian model, 1860, as used by the *Sranglieri*, £2 12s.; Swiss federal rifle, £4 15s.; revolver, £1 17s. 6d.; target pistol. All manufactured with the above pig iron.

From a very remote period the mountain villages in the Province of Brescia have been the seat of manufacture of arms, principally gun-barrels of excellent quality, for which the produce of the neighbouring iron mines is admirably adapted.

These manufactories were considerably improved, and obtained a large amount of work under the first kingdom of Italy, furnishing the Government 40,000 muskets annually, but they soon fell off, and their prosperity ceased for the want of large commissions for the army.

The vast improvements which have been introduced of late years into the make of military fire arms, and the necessity for the country to provide for a general armament, resulted in the formation of a Company, called the Lombard Manufactory of Arms, which erected a splendid building at Cariglio, near Lecco (Como), where they command several important falls of water, and have at hand abundance of wood for making the gunstocks. The works cover an area of 10,000 square metres, and contain the best and most recent machinery, set in motion by a water power of 50 horses, and employing about 800 workmen at wages of 1s. 3d. to 1s. 4d. daily.

The iron employed comes from the mines of Bondione, Schilpario, and Pisogne (Brescia), and undergoes every process in the works up to the finished arms. The company consider that they could furnish ten or twelve thousand muskets yearly and almost as many revolvers. They also manufacture rifles and fowling pieces both of cast steel and richly damasked.

**251 MARTINOTTI, LUIGI, U. via Barberana, Turin.**—Portable flying bridge, adapted for military, naval, and civil purposes, for loading vessels on a flat beach, in the absence of piers, &c. Apparatus suited for a look-out tower, fire escape, instantaneous scaffolding, &c. Fire escape or instantaneous ladder.

The above appliances of the exhibitor are placed on wheels for facility of transport. They are represented by models one-tenth of the actual size, and merit attention, from the great compactness and strength which they offer, combined with lightness, being all constructed on the same principle of diagonal bracing, and can be drawn out or folded together in a few minutes with the greatest facility by means of the wheel-work. The fire escape can be raised in the middle of a street without leaning against any building, so that a plank can be thrown across to the windows without in the least degree endangering the apparatus.

**252 PELLIZZA, GUSTAVO, manufacturer, via Principe, Turin.**—Walrus-wood gunstocks of various sizes:—For infantry muskets, 1s. 8d.; for rifles, 1s. 3d.; for muskets, 1s.; for horse-pistols, 8d.; for pistols, 5d.

This manufactory, situated in the outskirts of the city, employs twenty workmen, and is provided with steam power. It can turn out 700 rough stocks daily.

**253 PRIORA BROTHERS, GIUSEPPE & CARLO, manufacturers, via S. Vittore al Teatro, 7, Milan.**—15 shot revolver, £9 12s.; 10-shot ditto, £4 15s.; 6-shot ditto, £2 12s.; Lafaucheux 6-shot ditto, £2; Pugnè's ditto, with ornamental stock, £2; revolver, £1 12s. M., Florence, 1861.

The manufactory of Messrs. Priora, Brothers, is situated in the city of Milan. They devote themselves exclusively to making revolvers, in which they have obtained considerable success, having introduced numerous modifications, by simplifying the form, and rendering them lighter and more easy to handle, as well as securing the utmost precision, the whole combined with a certain degree of elegance and taste, though the prices are moderate. Some of these revolvers are of 15 consecutive shots. Thirty-two workmen are employed by the exhibitors.

**254 ZANONONI, FERNANDO, Napoli (Fluorav).**—14 shot

double-barrelled revolver, one with a diameter of 9 millimetres, the other of 7 millimetres. Price £8.

**255 MESSE, GERNANDO, 44, strada Sanle Dideri, Naples.**—Specimens illustrating a process of preserving wood from decay; sheet iron and copper rendered unoxidizable under water.

## SECTION IX.—AGRICULTURAL AND HORTICULTURAL MACHINES AND IMPLEMENTS.

[Number of Exhibitors, 4.]

**250 AGRICULTURAL ASSOCIATION, Lucca.**—Agricultural implements used in the province of Lucca, viz.:—Vanga, or shovel; zappone, or hoe; corregiato, or flail.

When efficiently used the shovel replaces the plough in the province of Lucca. The hoe serves for loosening the ground of whatever kind, and is specially adapted for preparing that of a hilly nature, for the sowing of seeds, and for taking up roots. It is very useful in the cultivation of terraces, in which no other implement would answer so well. The flail is that used throughout the Luccan territory for thrashing corn.

**251 BRACCHI, PIETRO, Valleggio (Paria).**—Iron plough, with modifications by exhibitor. Price £3 4s.

**252 FERRARI, BARTOLOMEO, Parma.**—Tinned iron apparatus for hatching silkworms' eggs. Price £5 8s.

This apparatus is filled with hot water, the temperature being maintained by a spirit lamp placed underneath, and regulated with a thermometer put in the same compartment as the eggs, which are kept moist by a gentle jet of steam rising from the reservoir below through a minute aperture.

The exhibitor states that with an insignificant consumption of spirit, the eggs are hatched quicker and more efficaciously than by the ordinary method.

**253 LAMBERTI, GIOVANNI, Parma.**—Machine for corking wine bottles. Price £6.

## SECTION X.—PHILOSOPHICAL INSTRUMENTS AND PROCESSES DEPENDING UPON THEIR USE; PHOTOGRAPHIC APPARATUS; MUSICAL, HOROLOGICAL, AND SURGICAL INSTRUMENTS.

[Number of exhibitors, 12. Of these 1 obtained a prize medal at the Great Exhibition in 1851; 1 at the Universal Exhibition in 1855; 4 at the Italian Exhibition in 1861; 1 a medal and 1 an honourable mention at the International Exhibition in 1862; 2 received medals and 2 honourable mentions at the Dublin International Exhibition in 1865.]

**258 BRIZIANO, Dr. ANSELMO, 1 via del Giardino, Milan.**—Models in wax:—Two feet affected with caries of the great toe; two others cured by the use of Briziano's compressive sticking-plaster; an arm, showing the method of applying Briziano's plaster after bleeding; an eye, showing the mode of closing the eyelid with the same plaster. Flexible bandages, apparatus for deformed feet, and improved surgical instruments for the feet.

**259 CARENA, NICOLA, clockmaker, 17 Piazza S. Giovanni, Turin.**—14-day escapement clock, with improved alarm, only requiring to be wound-up once in 12 days, and to be stopped at will at any time, for ships. This clock, having been made by hand, is not shown as a specimen of workmanship, but only for the improved arrangement. The lever on the right-hand side serves to set the alarm at any hour of the day or night, that on the left for stopping the alarm when no longer required. Having a spring escapement it is suited for ships.

**270 CASSANI, EMILIO, manufacturer, 5 via S. Vito al Pasquirolo, Milan.**—Fifty pairs of spectacles of different kinds. M., Florence, 1861.

**272 GORI, FRANCESCO, manufacturer, 14 via Figuerri, Naples.**—Mathematical instrument case for architects, with secret fastening. Price £4.

**273 LONGONI, DUROI, and DELL'ACQUA**, manufacturers, 12 *via Poppone, Milan*.—Philosophical and telegraphic apparatus:—

	£	s.	d.
Morse's telegraph, with Digney and Maroni's latest improvements, . . . . .	18	0	0
Tasto and pulsator, galvanometer, lightning conductor, translator for the above, . . . . .	5	6	0
August's double hygrometer, with double ventilator, . . . . .	10	0	0
Surveying level, with graphometer, . . . . .	10	8	0
Surveying level, with graphometer and altimeter, . . . . .	14	0	0
German silver mathematical instrument case, complete, . . . . .	8	0	0
Brass mathematical instrument case, . . . . .	4	0	0
Hypsometer, . . . . .	3	0	0
Anemometer, . . . . .	3	16	0

The manufactory of the exhibitors, known as the *Technomasio Italiano*, was founded in 1863, and is the only one of the kind in the kingdom on so large a scale, employing 60 workmen, and being carried on with division of labour for the several branches of physics.

Previous to entering into partnership, the proprietors received separately four gold medals from the Lombard Institute of Science, Letters, and Arts; six silver medals, including that of Paris in 1855, and several bronze medals. They still indefatigably study to improve the manufacture of every species of instrument relating to physics.

**274 MANZONI, LORENZO**, 58 *borgo Garibaldi, Milan*.—Two violins, with modified form of attachment of the handles, and varnished with a new kind of varnish. Price £4 each.

**275 MONTI, ELVIRA**, *Fabbrica Centrale Toscano, Florence*.—Surgical bandages and appliances.

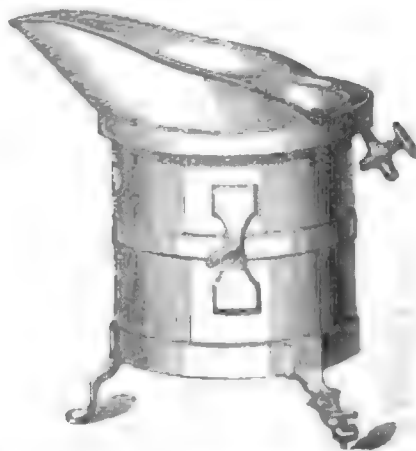
**276 MURE BROTHERS**, manufacturers of weights and measures, 33 *via Nizza, Turin*.—Patent apparatus for measuring the height of recruits. Price £4.



The measure itself consists in a framework supporting a tubular brass rod, graduated to half centimetres, and

terminating in a brass knob, which is brought down till it impinges on the head of the recruit, whose height is at once read off on the rod.

Half hectolitre of extreme precision for measuring wine. Price, £2 12s.



This vessel is of invariable capacity, and while it preserves the shape prescribed by law is very convenient for pouring out from one recipient into another. It stands on feet, two of which are supplied with micrometer screws, and is provided with a lip for pouring out the liquid, and surrounded with a canal for drawing off any waste by means of a tap. Inside is a scale divided to 5 litres.

Half decalitre of great accuracy, for dry measure. Price 4s.



The vessel consists of a wrought iron cylinder with a wooden bottom, which cannot be fraudulently stove in, and strengthened by axial and diametral iron rods.

German silver balance for chemical laboratories, turning with  $\frac{1}{4}$  milligramme. Price, £10. M., Florence, 1861; H. M., Dublin, 1865.

**277 PELITTI, GIUSEPPE**, manufacturer of musical instruments to H. M. the King of Italy, 1077 *via Pescheria vecchia, Milan*.—Collection of brass wind instruments. M., London, 1851; M., Paris, 1855; M., Florence, 1861; H. M., London, 1862; M., Dublin, 1865. House founded in 1750. The manufacture of brass musical instruments was for a long time carried on in Milan, as throughout Italy, without the introduction of any improvement. To the enterprise and intelligence of the late Giuseppe Pelitti, who died while these sheets were going through the press, is due a particular finish and precision in the make of instruments already known, as well as the introduction of several improvements into them, and the invention of entirely new ones. He deservedly obtained several prizes from the Royal Lombard Institute of Science, Letters and Arts, and at various exhibitions in which he took part.

The example of Pelitti served as a stimulus; other manufacturers began to turn out more carefully executed work, and new manufactories rose, though on a small scale. Milan provides the greater part of the musical bands in the kingdom with brass instruments, and Pelitti, having secured his inventions by patents, carried on a most extensive trade at home and abroad, supplying the military bands of numerous countries, where his instruments are much sought after, and enjoy considerable reputation. The number of brass musical

instruments annually manufactured in Milan may be assessed at 1,000, worth £6,400; the trade giving employment to 50 or 60 workmen.

Since the death of Pellati the manufactory has been carried on by his widow and his son Giuseppe.—Dr. GIOV. PIRANI.

378 RUFFINI, ANDREA, manufacturer, 13 Via Cordari a Buoncammino di Porto, Naples.—Collection of harmonic strings made in Naples, with lamb's gut. M., Dublin, 1865.

379 DEGANINI, COSTANTE, Florence.—Gold watch with two enamelled dials, one indicating the time, the other, on the back, showing the distance performed by a person on foot, a carriage, railway train, ship or steam vessel, and giving the velocity by the combination of the works. M., London, 1862; H. M., Dublin, 1865.

280 BOSIO, MICHELANGELO, Turin.—Improved escapement clock. Price, £6. This escapement was subjected to the inspection of the Watchmakers' Society at Paris, in 1865, and M. Redier, in his report to the Council, stated that it was new as a whole and in the details; that the applicability of the contrivance was very varied, and the execution excellent.

## SECTION XII.—WOOLLEN AND WORSTED.

[Number of Exhibitors, 2.]

284 LOPORTI, GIOVANNI, 44 strada Sotte Dolori, Naples.—Woollen yarn.

285 MAZZA and Co., manufacturers, Bellano (Como); office in Milan, 2 via della Sala.—Wool prepared by machinery from rags and cuttings, and employed in certain proportions with fresh wool for making shoddy goods, for the use of the poorer classes.

The art of working up woollen rags so as to produce yarn from them is of recent introduction in Lombardy. At first such rags were considered as useless, or sold at extremely low prices for manuring the fields. In 1858 it was attempted, almost as an experiment, to subject them to the processes already followed elsewhere, in a manufactory situated at Bellano, on the lake of Como, and the excellence of the result was made known on the occasion of the Italian Exhibition at Florence in 1861.

This mill subsequently passed into the hands of the exhibitors, who, having the necessary capital, combined with the energy, mechanical skill, and extensive commercial relations of M. Mazza, opened a large manufactory provided with all the best and most recent machinery, set in motion by the perennial waters of the torrent Pioverna.

The yarns produced in this mill, and dyed different colours, find easy sale in foreign markets, where they serve to make economical shoddy goods when mixed with certain proportions of fresh yarns. Three hundred persons, chiefly women, are employed in this establishment, which turns out at least 250 tons of wool annually.

Another mill was opened in 1862, at Menaggio, on the lake of Como, opposite Bellano, by Biraghi and Co., of Milan. Here also will be found the best machinery, set in motion by the torrent Senago; 300 persons are daily employed, who work up 160 tons of wool.

Thus, through the activity and enterprise of these firms, whose mills are the most extensive of the kind in Italy, a waste substance gives work to numerous families, and supplies spinning mills and cloth manufactories with the raw material, at a price sufficiently low to enable them to offer to the less opulent part of the community an article adapted to their wants and proportionate to their means.—Dr. GIOV. PIRANI.

## SECTION XIII.—SILK AND VELVET.

[Number of Exhibitors, 20. Of these 2 obtained prize medals at the Paris Exhibition in 1855, 9 at the Italian Exhibition at Florence in 1861, 4 obtained prize medals and 3 honourable mentions at the International Exhibition, London, in 1862; and 14 received medals, and 2 honourable mentions, at the Dublin International Exhibition, 1865.]

289 BERNARDI, CHEV. FRANCESCO, Castiglione Berardengo (Sienna).—Raw silk, the produce of silk worms fed entirely on the leaves of the *Maclura aurantiaca*, an experiment carried on by the Exhibitor for several years past at his estate of S. Giovanni.

290 ABBATI, PIETRO, silk spinner, Parma.—Raw yellow silk; title 7 denari. Raw yellow silk, spun by a new process, offering sufficient strength to serve directly for the warp or weft of any kind of stuff. M., Florence, 1861; M., London, 1862; M., Dublin, 1865. Manufactory founded in 1856, and employing 150 persons, whose wages vary from 1s. 3d. to 2s. 6d. per diem.

291 BANCALANI, ETTORÉ, silk spinner, Caltanissetta (Genoa).—White and yellow raw silk. M., Florence, 1861; H. M., London, 1862; M., Dublin, 1865.

292 CERREIA BROTHERS, silk spinners, Macerata.—Raw silk. M., Dublin, 1865.

293 CIMBARDI, ALESSANDRO, manufacturer, 9, Piazza del Carmine, Milan.—Sewing silk, produced from twin cocoons. M., Dublin, 1865.

294 CONSERVATORIO DELLA MISERICORDIA, Sesto (Genoa).—Specimens of velvet.

295 DE FERRARI, T. G. B., late FRANCESCO, manufacturer, Genoa.—24 pieces of black and coloured silk velvet. H. M., London, 1862; M., Dublin, 1865.

296 DE VECCHI, PAQUALE & Co., manufacturers, 2, via Monte Pietà, Milan.—Italian and Asiatic raw silk, organzine and tram. M., Dublin, 1865.

297 DELPRINO, CHEV. DR. MICHELE, silk spinner, Vesime (Alexandria).—Raw yellow silk. M., Florence, 1861; M., London, 1862; M., Dublin, 1865.

Portion of a patent cellular apparatus, invented and employed by exhibitor for preserving each worm apart while spinning. The same containing the cocoons. Pamphlets describing the merits of the improved process and the results obtained. M., Florence, 1861.—(For illustration see page 430.)

The advantages of Delprino's system of isolating the silk worms while forming the cocoon were this year subjected to the examination of a Commission appointed by the Minister of Agriculture, Industry, and Commerce. The experiments were carried on:—

At the Crocetta, Turin, on the premises of the Royal Agricultural Society, with Japanese cards and American eggs.

At S. Salvario, Turin, by Avv. Bassignana, with Armenian and Macedonian eggs.

At S. Donato, by Chev. Fra di Bruno, with eggs obtained from Japan, reared one season in Italy.

At S. Donato, by M. Guglielminetti, with Karadagh and Macedonian eggs.

At the Bridge of the Dora, on M. Audifredi's farm, with Portuguese eggs.

Near the Bridge of the Dora, on M. Nigra's farm, with Macedonian eggs.

At the Albergo di Roma, in the city of Turin, with Armenian eggs, and original Japanese cards.

At Pignerolo, by M. Vagnone, with Portuguese and Macedonian eggs.

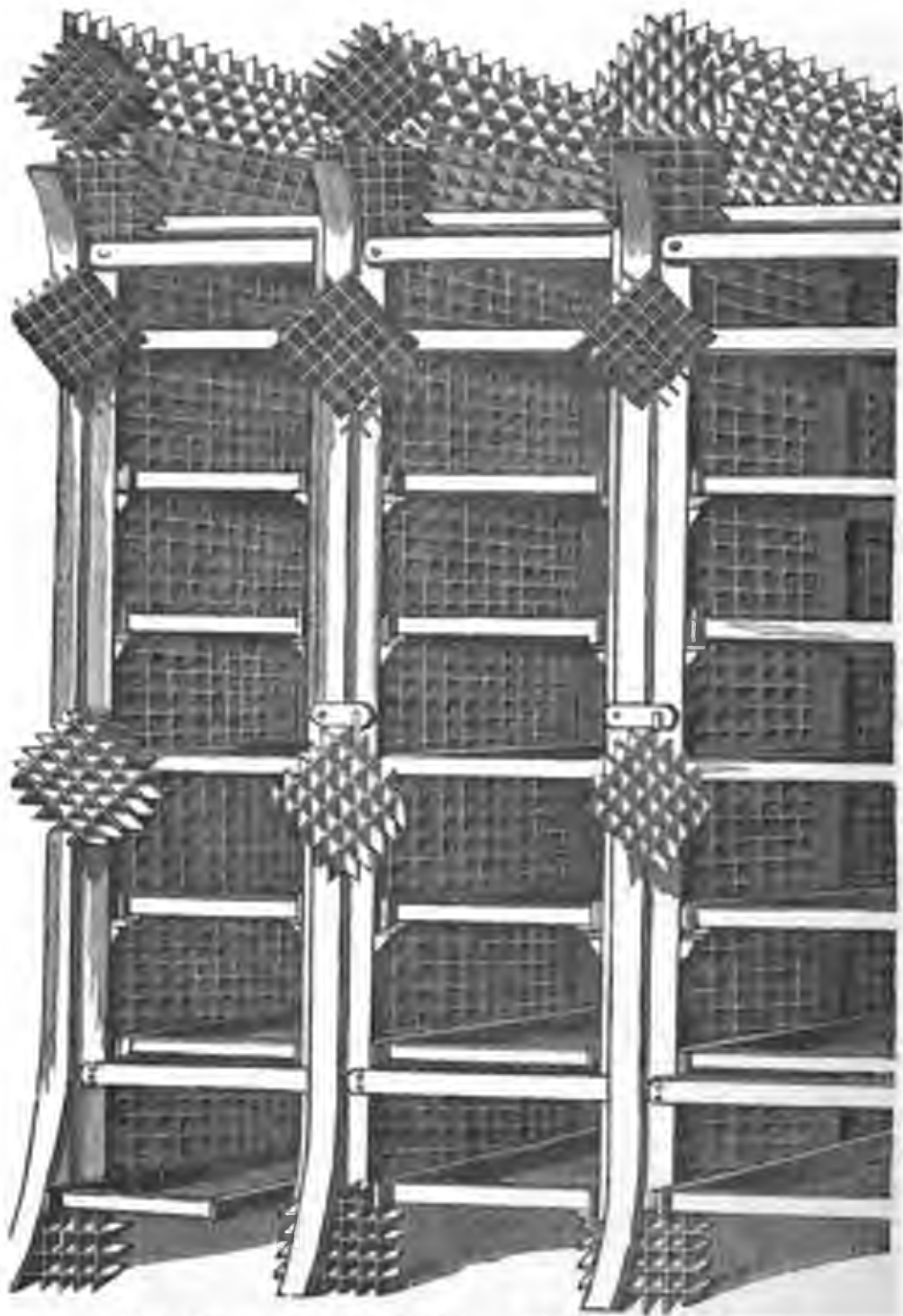
At the Battiglieria d'etati (Alexandria), by Avv. Arcozzi, Masino, with Japanese eggs, reared one season in Italy.

At Alexandria, by the President of the Chamber of Commerce, with original Japanese and Caucasian eggs.

The contrivances for managing the silkworm while spinning may be varied at pleasure, and many of them present much adaptability and ingenuity, and last for years, but to the exhibitor is due the merit of introducing a cellular arrangement, by which each silkworm can spin independent of the others; indeed it is just to observe that Dr. Delprino has devoted his life and property to the improvement of sericulture.

The Commission found that the cellular apparatus presented numerous advantages:—

1st. In having the framework always ready at hand, and being able to put it together at the proper moment, without moving or disturbing the worms, or interrupting



Delprino's Apparatus for Isolating Silkworms while Forming the Cocoon.

the work of the attendants, which is necessarily doubled during the few days preceding the time when they begin to spin; and especially in providing free circulation of air.

2nd. In presenting to the active and sluggish worms alike, an easy means of climbing up to a comfortable, dry, and agreeable place for spinning, without necessitating them to wander about in every direction, at considerable loss of strength and silk, before they can fix upon a suitable place. This offers a contrast to the common plan in which bushes or twigs are hastily put together—often while still green—and in which the worms, after long delay, at length commence working, often producing imperfect and small cocoons; nay, in many cases the

crysalis is barely covered with an envelope of silk, owing to the useless preliminary waste of the filament to which allusion has been made.

3rd.—As the worms can proceed to work at once without interruption, the cocoons produced are more regular and heavier by the adoption of Delprino's apparatus. An increase of from 10 to 20 per cent. was ascertained by the Commission, in the experiments carried on at Priserolo and Alexandria.

4th. The number of twin cocoons is considerably reduced from what is generally the case at present by the use of bushes. By Delprino's apparatus, even with Portuguese silkworms, which are the most inclined to spin in company, as many as seven having been

known to work together in a single cocoon, the number of cocoons was found to be only 5 per cent. against 22 to 30, as is usually the case.

5th. Greater cleanliness is obtainable than when there is no division between the worms, as they climb about preparatory to spinning, and it is possible to avoid the spots produced on the silk by the dead silkworms which generally exist among the branches, rendering it difficult to wind off the silk properly. It was found at Bergamo that, whereas by the common plan there were 25 to 30 per cent. of spotted cocoons, by Delprino's system they were reduced to 3 per cent.

6th. Delprino's cells were proved to be adaptable, with the utmost ease and speed, to the usual silkworm establishments, without deranging the worms, whatever be the dimensions necessitated by the special size or form of the matting employed, and the size of the cell was regulated by folding more or less, according to the requirements of the particular race for which they were used, so as to reduce the number of twins to a minimum.—**ANCOZZI MARINO.**

Professor Cinelli, of Macerata, writing a report to the government last year, highly commended Delprino's apparatus. "There is (says he) a great economy of space, so many trays being superposed. It can be placed with advantage in any apartment without inconvenience to any one, or injury to the most elegant walls or floors; thus it permits the ladies of Northern Italy, who take considerable interest in attending to the silkworms personally, to keep them in their own sitting rooms, instead of banishing them to an outhouse."

The apparatus has a certain elegance, and may be made sufficiently strong to suit it for being handled by rough peasants. The space allotted to the worms to be reared, in every stage of their growth, is absolutely defined by the number of cells corresponding to each tray. Such an arrangement ensures the silkworms considerable facility of access to the leaves supplied to them, instead of having to struggle for them. Moreover, better ventilation is attainable, and this is known to be the great secret of proper management, as may be judged from the numerous little respiratory apertures with which the little creature is provided along its back, and the miraculous rapidity of its growth, increasing as it does 7,000 times its own weight in the space of a few weeks.

The number of attendants is reduced by the use of Delprino's invention to a fourth, and at the proper time the silkworms can at once proceed to spin the cocoon, which is consequently heavier than when they have to make numerous vain attempts to commence their work. It only needs a certain degree of attention to obviate the possibility of the formation of twins. Each silkworm being separated from the rest, such as die in their cell cannot stain the silk of the rest, and nothing is easier than to remove them with a pair of pincers. Above all, the farmer has absolute control over the worms, and none can be abstracted by dishonest attendants without the fact being at once discovered.

It may be added that in rendering the rearing of silkworms an amusement, suited to the most delicate lady, the exhibitor has been extremely happy in his idea. Indeed they cannot but be better reared by such means than by farm servants altogether ignorant of their physiology, and acting by purely mechanical routine; so that sericulture is ennobled, a better produce is obtained, and this source of national wealth considerably extended.—**ORRIDGE CINELLI.**

298 GIOVANELLI, AMATO, *Pesaro*.—Raw silk, title 9 to 11, with some of the cocoons from which it was produced. H. M., London, 1862; M., Dublin, 1865. The manufactory contains 54 basins.

299 GRILLI, RAFFAEL, *Ancona*.—Raw silk.

300 KELLER, Chev. ALBERTO, manufacturer, *Villa-moravia, near Saliceto*; office in Milan, 933 via S. Paolo.—Raw silk and organzine of various titles, spun from the cocoon and reeled directly by an improved process invented by the exhibitor. By this process the silk is

perfectly dry before reaching the bobbins. The mills are situated within two hours by railway from Turin. There are 102 copper pans in the mills. The exhibitor states that the silk obtained by his process is evenner, more elastic, and stronger than usual. Samples exhibited:—

Raw silk on bobbins, to be converted into organzine:—

No. 48. Raw silk, 8/9 deniers.

" 50. " 10/11 "

" 49. " 12/13 "

Organzine derived directly from the above bobbins, in skeins:—

No. 48. Raw silk, 16/18 deniers.

" 50. " 20/22 "

" 49. " 24/26 "

Singles for Nottingham articles, upon bobbins and in skeins:—

No. 53. Raw silk, 20/22 deniers.

" 51. " 24/36 "

" 52. " 28/30 "

The former from Caucasian cocoons, the two latter from cocoons reared in the neighbourhood of the mills.

M., Paris, 1855; M., Florence, 1861; M., London, 1862; M., Dublin, 1865.

301 LANZANI, LUIGI, & BROTHERS, manufacturers, *2 via del Rovello, Milan*.—Hand and machine-carded silk waste, made from waste of various kinds. M., Florence, 1861; H. M., London, 1862; H. M., Dublin, 1865.

302 LAZZARONI, PIETRO, producer, *8 Piazza di S. Sepolcro, Milan*.—Chinese, Japanese, and Bengal silk; Italian silk, produced by exhibitor, and spun with 1, 2, and 3 threads for weaving. H. M., London, 1862; M., Dublin, 1865. Principal markets, France, Switzerland, and the Rhine district; annual sale about 15 tons.

303 MODENA BROTHERS, CERRARE and ISALIA, silk spinners, *Reggio in the Emilia*.—Raw silk. Price £2 2s. per lb. H. M., London, 1862; M., Dublin, 1865.

304 MONCHETTI, ANGELO, *Como (Como)*.—Raw silk. M., London, 1862.

305 MONCHETTI BROTHERS, manufacturers, *Sala and Oivate (Como)*; office in Milan, *2 via S. Giovanni quattro faccie*.—Raw silk, organzine, and tram. M., Paris, 1855; M., Florence, 1861; M., London, 1862; M., Dublin, 1865.

306 ROTA, ANTONIO, silk spinner, *Chieri (Torino)*.—Raw white silk, from Chinese silkworms; raw yellow silk, from Albanian and Bucharest silkworms; twin cocoons, Albanian and Bucharest races. M., Florence, 1861; H. M., London, 1862; M., Dublin, 1865.

307 ROCCARDI, LORENZO, *Cres (Cremona)*.—Raw silk. M., Florence, 1861; H. M., Dublin, 1865.

308 VECCHI, JODI, *Reggio d'Emilia*.—Yellow and white raw silk. M., Florence, 1861; M., Dublin, 1865.

*Silk Manufacture of Milan*.—Milan, besides holding incontestably the first rank among the cities of Italy for its silk trade, contains within its walls numerous important commercial houses, which likewise reel and spin the silk they sell. The province of Milan is, moreover, one of the first for the production of cocoons, both as regards quantity and quality; those of the upper part of the province, and known as Brianza cocoons, being the best. Previous to the ravages produced by the silkworm disease, which has been so general of late years, the production of cocoons in this province varied from 3,500 to 4,000 tons, according to the season, representing, at the lower prices at which they were then sold, a value of from £420,000 to £480,000.

The Milanese silk manufacturers, however, not only possess and superintend numerous mills for reeling and spinning tram and organzine within the province, but carry on a great many others in the neighbouring provinces, especially in that of Como. Not to speak of the vast number of small silk reelers who have only from 2 to 11 basins, there are in the province of Milan 140 reeling mills (*filande*), containing from 12 to 140 basins, 28 of which are heated with steam, the rest by water. These are in operation for about two months annually, giving occupation, during that time, to no less

than 12,000 persons, half of whom are women, the rest girls; the former earning about 9d. per diem, the latter half that sum. The spinning or twisting mills (*filatoi* or *torcitoi*) amount to 96, containing a total of 18,968 spindles, and giving daily employment to about 1,100 men, women, and children, whose wages may be taken respectively at 1s. 6d., 8d., and 4d.

Since the introduction of the silkworm disease into Lombardy the produce has fallen to half, a third, a quarter, and even to a fifth of that previously obtained, varying according to the province, the locality, and the year itself. Incalculably great as this loss may be to the country, but especially to the silkworm rearers and landed proprietors, the reeling and spinning mills have not suffered by such a deplorable misfortune, owing to the intelligence and activity of the manufacturers. The Milanese houses, in fact, procure work for their reeling mills by purchasing largely Asiatic cocoons at Venice, whither they likewise resort for the Asiatic raw silk which they spin with the most admirable success into tram and organzine.

Silk reeling and spinning is an art which has existed in Lombardy from very remote times, and it has become, so to speak, a kind of heir-loom in some families, passing for generations from father to son, so that it is by no means uncommon for such houses to date back for centuries. It can easily be understood how this circumstance ennobles the occupation, producing a love for the art, a skill which increases with time, a feeling of emulation tending to produce the best result with the least expense, and an enterprising spirit which encourages to study and carry out modifications adapted to every kind of silk, and thus tending to attain the highest degree of perfection. It may be safely said, without any fear of exaggeration, that the Milanese reeling and spinning mills have reached this point, and the assertion is fully confirmed by such facts, as the esteem in which they are held by the manufacturers on the Rhine, in Switzerland, and even in France, where silk is likewise spun in the most admirable manner; the medals awarded to nearly all the Milanese silk spinners and reelers at the Italian Exhibition in 1861, and the International of 1862; and lastly, the great gold medal conferred on the Milan Chamber of Commerce at the Paris Universal Exhibition in 1855, as representing the general silk interest of the province.

Although exceptional circumstances have prevented that concurrence of Milanese manufacturers at the Dublin International Exhibition which was at first anticipated, three of them, Keller, De Vecchi, and Ronchetti, are houses of the most important class, and the samples of raw and spun silk which they have sent will show the perfection attained in winding, spinning, and throwing this precious fibre. The first mentioned of these manufacturers likewise exhibits silk obtained by a process of his own, which he states to be more expeditious, economical, and useful, combining, as it does, two operations in one. Another exhibitor has sent sewing silk, which, having been prepared from silk made by twin cocoons, cannot be twisted uniformly so as to present the various degrees of size without accurate study and careful examination, to ensure the smoothness of the thread and regularity of the work in the several operations, as well as a judicious choice of the silk itself. This exhibitor annually manufactures about ten tons of sewing silk, for the most part sold in France and Germany for making fringes.

Another exhibitor shows with what success he is able to card silk waste by hand and power, and what progress has been made in this art during the past few years. This waste has little intrinsic value, but when carded with intelligence and accuracy, and spun very equally, serves, either alone or mixed with other silk, wool, or cotton, for the manufacture of goods of such beauty as to appear entirely made of silk. Silk carding is carried on by 10 manufacturers, large and small together, and employs about 2,000 men, women, and children. The total annual production may be taken at 200 tons.

In the 12 silk dyeing works existing within the walls of Milan, upwards of 240 men are employed, who dye annually not less than 220 tons of silk. Without pretending for a moment to assert that the Milanese silk dyers can compete with the French, especially in new colours and half tints, it is but just to say that great improvements have recently taken place, while, on the other hand, Milanese dyers are celebrated for their mineral black, which they sell in great quantities to Swiss and Rhenish manufacturers.

Bruni's dyeing works are very ancient, having been founded about a century ago. The exhibitor assumed possession of it in 1821, and has directed his attention, with diligence and care, to his own art. Aided by the progress of chemistry, he has been enabled to introduce great improvements—heating by steam, and having in the works steam engines, and all the most improved kinds of machinery. He has been awarded several medals at different exhibitions; and dyes for foreign sale alone upwards of thirty tons of silk annually.\*

As far as regards the consumption of dyed silk for the Lombard silk manufactories, which are confined to the two provinces of Milan and Como, the dye works receive fewer commissions than formerly, owing to the severe blow the weavers have sustained by the Government having suddenly taken off the import duty on such goods since the late Treaty of Commerce—rendering it extremely difficult for them to compete with French manufacturers, even for plain silks, which would not have been the case had sufficient time been allowed for adopting measures necessary in order for them to keep their ground.—DR. GIOVANNI PISANI.

#### SECTION XVI.—LEATHER, INCLUDING SADDLERY AND HARNESS, SKINS, FURS, FEATHERS, AND HAIR.

[Number of Exhibitors, 2. Of these 1 obtained a prize medal at the International Exhibition, 1862; 1 received a medal at the Dublin International Exhibition, and 1 an honourable mention.]

**350 MELEGARI, NATALE**, foreman of the manufactory of Felice, Endrich, *Parma*.—6 skins of white waxed calf leather, for men's boots. Price, per lb., 3s. 3d. 8 skins of black waxed calf leather, for boots, 3s. 8d. H. M., Dublin, 1865. This manufactory was established in 1825, and employs 12 workmen, who receive from 16 to 20d. per diem. The leather is prepared with the English knife, and waxed with tunny oil and *dégras*.

**351 PELLERANO, GIOVANNI BATTISTA**, manufacturer, 193 *strada Chiaja, Naples*.—Prepared glove skins. Price per dozen:—Kid skins, £7 10s. 8d.; lamb skins, 18s. 9d.; sheep skins, 18s.; small lamb skins, 14s. M., London, 1862; M., Dublin, 1865.

#### SECTION XVII.—PAPER AND STATIONERY, PRINTING AND BOOKBINDING: EDUCATIONAL APPLIANCES.

[Number of Exhibitors, 17—Sub-exhibitors, 5. Of these 2 obtained prize medals at the Italian Exhibition in 1861, and 1 at the International Exhibition in 1862; at the Dublin International Exhibition in 1865, 6 received medals, and 3 honourable mentions.]

**355 CORDOVA, NICOLA**, *Palermo*.—Ornamental designs. H. M., Dublin, 1865.

**356 CANBIAGI, Chev. FRANCESCO**, Director of the Royal Printing Office, *Florence*.—Copy of the *Specilegium Liberianum*, by Francesco Liverani, exhibited as a specimen of printing; the same work bound in morocco, with German silver mounting and clasps; copy of certain documents relating to the royal houses

\* The five Milanese exhibitors of silk at the Dublin International Exhibition of 1865, all received prize medals; so did the only Milanese exhibitor of dyed silk, while the remaining manufacturer of carded silk waste obtained an honourable mention—thus far confirming the statement of Dr. Pisani.

of Savoy and Bragana, bound in maroon, and ornamented with monies. M., Dublin, 1865.

**357 CASTELLI, Prof. GIACOMO, via di Po, Turin.**—Specimen of ornament and penmanship executed on geometrical principles, with ornament in relief executed by the pen, for the use of t-classical schools; series of copy books illustrating the geometrical principle of teaching writing adopted by Prof. Castelli in technological schools in Turin.

**358 DALMAZZO, ENRICO, printer, via S. Domenico, Turin.**—*Dictionnaire Polyglotte en onze langues, par le Colonel Louis Calligaris, 1st and 2nd parts*—exhibited as a specimen of printing.

**359 FEA DI PIENO, Chev. FRANCESCO, 21 Borgo S. Donato, Turin.**—Writing apparatus for the blind. H. M., Dublin, 1765.

By this simple apparatus persons who have lost their sight since they have learned to write, can write straight and with the greatest ease both small and capital letters. The inventor received a medal from the *Société d'Encouragement* in Paris, and the approbation of numerous competent persons interested in the welfare of the blind.

**360 FORIANT, FIORENZO GIUSEPPE, 16 via S. Massimo, Turin.**—Writing copy books for elementary and other schools, comprising 7 books of English hand, 2 of French hand, and 2 of German capitals. Price of each, 1d.

**361 FRANCO, SEBASTIANO and SONS, publishers, 17 via Cavour, Turin.**—Series of school books, used in technological schools and gymnasia.

**362 MAGLIA and MUSSO, via Babarozzi, Turin.**—Copy books.

**363 MAGLIA, PIGNA and Co., paper manufacturers, Vaprio (Milan) Meda (Como), and Alzano Maggiore (Bergamo); Office in Milan, 5 via dell'Unione.**—Collection of samples of paper. M., Florence, 1861; M., London, 1862; M., Dublin, 1865.

Numerous paper manufactories exist in the province of Milan; 8 for hand-made kinds, and 3 for machine paper. In the former are produced common sized paper and pasteboard, in the latter a great variety of both white and coloured paper is manufactured, as well as letter, office, printing, drawing, and endless paper.

The aggregate daily produce of hand-made paper may be taken at 1 ton, occupying 50 men, women, and children; that of machine paper at 4 tons, occupying 340 persons. The wages are—men, 16d.; women, 7d.; children, 5d. to 6d.

The common hand-made paper is used in the Province, the machine made kinds are chiefly sold in Northern and Central Italy, only a small quantity going to the southern mainland provinces and Sicily.

Assuming that there are 300 working days in the year these mills will turn out about 1,500 tons of paper, and judging from the different quantities manufactured of each kind, and the several wholesale prices, we get a mean price of 5d. per lb., or a total annual value of £72,000 for the paper manufactured in the Province,

while it is calculated that the total produce of the whole of Lombardy is 3,360 tons, worth £161,280. Maglia, Pigna and Co. have two mills for machine made paper, the one at Vaprio (Milan) containing two hydraulic machines moved by the waters of the Martesana Naviglio, the other at Alzano Maggiore (Bergamo), with one hydraulic machine, besides some small mills for hand papers.—Dr. GIOV. PISANI.

**364 MINISTREY OF PUBLIC INSTRUCTION, Turin.**—Various works executed in the blind and deaf and dumb asylums, to show the nature of the employment of the inmates. M., Dublin, 1865.

The Deaf and Dumb Institution at Palermo contains 30 boarders, including 17 boys and 13 girls; some other day pupils also attend the schools. The promoter of this establishment was the Abbot Dixit Dominus who, in 1834, introduced into Palermo the art of speaking by signs. This art, first used in Italy by Cardano of Pavia, in the 16th century, has made considerable progress through the labours of Assorotti, Provolo, Pendola, Lana, and San Vitale, so as to give to the deaf and dumb great facilities for communicating with their fellow-creatures.

Though there are 1,868 deaf and dumb persons in Sicily, this is the only Institution for them. The number of blind persons is still greater, but up to the present moment they are entirely unprovided with an Asylum.

Congenital deafness has been ascribed to many causes, amongst others to intermarriages amongst near relatives, which is decidedly a physiological cause of degeneracy, and contrary to the spirit of civil and canonical law, though hitherto it has been too frequently practised in Sicily. Other causes are to be found in sudden frights, violent commotions, and bodily pain during the period of gestation, which exercise such dangerous influence on the foetus.

Deafness and dumbness after birth, more common in Sicily than the preceding, and than is generally supposed, are to be ascribed to eruptive diseases among children, such as scarlatina, small pox, and scrofula, for which there is often a want of proper care.—FEDERICO LANCIA DI PISTOIA.

The *Blind Asylum* at Milan originated with its present director, Chev. Michel Barozzi, who entered on his labours in 1840, as a mere experiment, in the *Pia Casa d'Industria*, or Workhouse of S. Vincenzo, with one male and one female inmate. Subsequently they were transferred to the workhouse of S. Marco, where M. Barozzi continued to be director, and where, by help of the funds provided by the citizens, the Institution assumed larger proportions. After a personal study of the principal establishments of this kind elsewhere, all those appliances which seemed the most suitable were introduced, in order to render the children of the less wealthy classes useful to themselves and to society.



View of the Blind Asylum at Milan.

At length in 1855, the space at the disposition of the Asylum in this new building being inadequate to its growing wants, with the help of a donation of 50,000 francs, bequeathed by M. Sebastiano Mondolfo, the institution was transferred to its present position, a commodious house with a garden, situate in the Strada S. Angelo, where the number of boarders is 68, including 42 males and 26 females, besides 2 out-door pupils.

The requisites for free admission are :—To have been born of poor parents ; to be between the ages of 10 and 15, of which at least 10 spent in Milan. Children of the above ages, not born of poor parents, are likewise admitted, even though they do not belong to Milan, on payment of an annual sum of 260 francs, or £10 8s. for their board and clothing, all other expenses of lodging, attendance, instruction, &c., being borne by the institution. The government assigns a sum of money for nominating on similar terms 10 indigent pupils from any town in the kingdom, and Sig. Mondolfo has bequeathed a like amount for the same purpose.

The institution is managed by a director and inspector, both honorary, assisted by a paid steward and *ragioniere*.

For the instruction of the boys there is a master for the elementary branches of knowledge, a French master, and three teachers of trades, who are at the same time guardians. Two mistresses attend to the instruction of the girls in the classes of elementary knowledge and French, a third superintends the work. Religion and Sacred History are taught to the boys and girls by a priest, and music by eight principal masters, chosen among those held in most reputation in Milan, who give their lessons at stated hours, and are paid so much for every time they attend.

In addition to the above there are three blind pupil teachers who have completed their course of instruction in the institution ; two for elementary instruction and one for French, all assisting in teaching music. One of the female pupils likewise assists in teaching French, the pianoforte, and the harp.

These, besides having the same privileges as the other inmates receive payment for their services. Mutual instruction is generally adopted in every branch.

The text books employed are those in general use in the public schools in Milan, reprinted in relief by the pupils themselves. Composition in ordinary printing types, principally for the use of the institution itself, is also executed by the boys.

Several methods of writing are employed, especially with the pencil, or a steel point tracing on blackened paper, placed over a sheet of white paper, in either case enclosed in a simple wooden frame with a cross bar fitting into equidistant notches at either side, serving to regulate the space between the lines. Other kinds of apparatus are also made use of, such as that of Foucauld, who was himself blind, although it is somewhat complicated ; lastly, the apparatus of the Director Barozzi himself, a simplification of the latter, and made in the shape of a fan, but provided with forty-eight stamps, each terminating in a capital or ordinary letter, instead of only ten stamps, as in the former case, in which the letter is traced with a point. Barozzi's apparatus does not, however, produce such elegant writing as that of Foucauld.

The work executed by the boys is confined to the manufacture of *cordelle*, various kinds of nets, brushes, baskets, and in a few instances composing in printers' types, and weaving swaddling bands for babies ; music being in most cases the principal employment. The girls, on the other hand, perform almost every kind of needlework taught in ordinary schools.

At the Paris Universal Exhibition of 1855 the establishment, and several of the girls, obtained an honourable mention for a worsted-work carpet in different colours, dedicated to their sisters in misfortune at the Paris Blind Asylum. A medal was likewise awarded at the Florence Exhibition in 1861, for another worsted-work carpet. In order to execute such work the pattern in relief is placed on paper divided into

minute squares, corresponding with the holes in the canvas, accompanied by all the necessary explanations for the use of the girls.

It is obligatory on the boys to learn the organ—by playing which they generally get their living in after life—the pianoforte, and a third instrument of their own choice, that for which they show most aptitude. To this is added musical composition and the art of tuning pianos. Once a year the Government gives the institution a benefit night at the theatre of the Scala, on which occasion the most advanced pupils perform pieces of their own composition during the intervals between the acts. Musical instruction for the girls is limited to the pianoforte, and in a few instances the harp. Two of those who may have fine voices are taught the higher class of singing. Both boys and girls are trained to sing sacred music in chorus.

Music is taught by the ordinary methods, especially those of Azzioli and Czerny, but printed in relief. The institution is provided with the requisite instruments and books, and in general with relieve editions, belonging to the various branches of knowledge taught.

The pupils wear a stated dress, though this has no peculiarity in it. When the weather permits they are taken out for a walk, or play in the court-yard and garden attached to the building ; on other occasions they amuse themselves with music or games ; occasionally and during the carnival they are taken by turns in batches to the opera, to cultivate their taste for music. Twice a week they attend the chapel adjoining the Asylum.

When slightly indisposed a medical man, whose services are gratuitous, attends the children. In more serious cases the boys are, if possible, confided to the Fate-bene friars, and the girls to the Fate-bene nuns ; those who can afford it are either transferred to the neighbouring hospital or otherwise provided for by their parents. In general they enjoy good health, and with the exception of three sickly girls, it rarely happens that they have to be taken out of the establishment for advice. The feelings of compassion expressed by visitors or those coming across them elsewhere, are often thrown away upon them, and as a general rule their spirits are good, except such as have been deprived of the use of their sight since they have grown up, and who naturally feel most keenly the privation of so precious a boon. Their disposition is in most cases gentle, and they evince gratitude for the care bestowed on them, while they are tractable, respectful, and submissive in their ideas and demands. They are inspired with a love of liberty and of their country, of which their compositions give frequent evidences, are firm in their loyalty to the King, and have deep religious feelings, which contribute powerfully to soften the tremendous privation it is their lot to endure.

It is a matter of pride for the pupils to distinguish themselves in their studies and to show off to advantage in public examinations the knowledge they have acquired ; attaching great importance to obtaining prizes at their final examination on leaving the institution, and which, in the case of poor pupils consist generally of some musical instrument, which may be useful to them in after life.

The education thus given to the blind affords them a great consolation under their heavy affliction. Those who belong to families able to provide for them can occupy themselves agreeably, while others who have to procure their own living, are assisted before leaving the asylum in finding some situation as organist in the vicinity of their native village, by which, together with lessons on the piano, tuning pianos, and the exercise of the trade they have been taught, they manage to procure a modest living. It sometimes happens that they acquire sufficient musical skill to enable them to perform at theatres. The young women are able to attend to domestic occupations and sometimes procure a slender sustenance as sorters of raw silk.

The director does not lose sight of the young persons

after they have entered the world, keeping himself informed of their condition in case they need his help.

The expenses of this asylum in 1863 were 42,793 francs (£1,712) including taxes. During the same year the income derived from property, bequests, and donations amounted to 24,655 fr.; 13,282 fr. were furnished as fees by the pupils themselves and by the government quota of 2,600 fr., the remaining 1,736 fr. were provided by subscriptions, grants, and various sources, including the profits of the benefit night at the Scala theatre.

The Director annually draws up a report of the requirements of the asylum, and at the close of the year presents to the trustees a report giving all information regarding the progress and moral condition of the institution.—MICHELLE BASCCHI, *Director*.

365 PARAVIA, GEO. BATTISTA AND G., publishers, 23, via Dorogrossa, Turin.—Collection of educational works, 104 volumes; school books, adopted in the elementary, technological, gymnasia, liceal, and normal schools of Italy. M., Dublin, 1865.

Of the school books, a large number have been sold within the last few years throughout the kingdom. Of the smaller series of books, recently issued, 12 volumes have been very favourably received and several thousand copies disposed of in every part of Italy. Various other little books, no less useful and important, are exhibited, and these like the preceding find easy sale.

Globes were until lately imported from France and Germany, but they were very expensive. Seeing the importance of furnishing these to schools the exhibitors determined to manufacture them on their own premises, so that they are now able to exhibit a complete series of terrestrial and celestial globes, armillary spheres, planetary, and solar systems, &c.

The want of wall diagrams of natural history was greatly felt in Italy, as they had been elsewhere found so eminently useful in helping the masters in carrying out their lessons on this subject, especially in the higher classes. The exhibitors fearlessly embarked in the expense of providing well executed and scientifically arranged lithographs, illustrating the several kingdoms of nature, which would bear inspection and please the eye of the lover of the Creator's works, whether a youthful or adult student. Two series are already published, comprising zoology and botany. Wall maps are expensive in their preparation and difficult of sale, so that few publishers in Italy have ventured on the speculation.

The table of geometrical nomenclature offers nothing remarkable, beyond the fact of its being made in Italy, whereas until lately they used to be imported from abroad. The geographical atlas has been compiled from the most recent documents, shows the present political divisions and the new lines of railway, and is constantly corrected up to the time of issue.

The fractional abacus is an indispensable apparatus for primary schools, and has been prescribed in the government programme as essential for teaching mental arithmetic to children. The series of the principal geometrical figures is one of the most useful things in schools for imparting a knowledge of geometrical nomenclature.

Trossi and Delpino's method of teaching writing has been adopted by the Minister of Public Instruction for the primary schools of the kingdom, on account of its simplicity and efficacy. Each copy-book costs only 5 centimes or a halfpenny. The exhibitors state that they have sold 2,000,000 copies within the last few years; and on the whole their labours aid to produce, in however humble a manner, a powerful revolution in the intellectual condition of the country.

366 DE, GIUSEPPE, engraver and printer, 4, via Biondia, Turin.—Specimens of anapo-chromography, or embossed printing in colours, and proposed applica-

tion to the production of postage and receipt stamps, envelopes, dies, &c., which cannot be counterfeited, viz.:—Stamp with national arms for unpaid or insufficiently paid letters; postage stamp for printed matter, with the national arms and head of the king; ditto for letters, various designs and values, with microscopic filigree work; ditto, embossed to resemble lace (plain white); telegraph stamps of three different kinds in one and two colours, with the national arms; white telegraphic stamps in relief, to imitate lace; money order stamps; dies for envelopes for public offices, &c.; passport stamps. M., Dublin, 1865. The postage stamps would cost about one franc per thousand, or a quarter less than the price now paid by the government.

The extensive use of paper money, if such a term may be applied to postage, receipt, and bill stamps, sufficiently proves its utility, though there is the utmost danger in the system, unless governments take the greatest precaution to guard against falsification. The exhibitor, seeing the importance which would result from such an improvement, turned his attention to manufacturing stamps which it would be extremely difficult or impossible to copy. He came to the conclusion that of the two kinds of stamps, the first simply printed in colours, the other embossed, the latter was preferable, being infinitely more difficult to imitate, and requiring far greater skill in the execution.

The samples exhibited required to be examined with a strong lense in order to perceive the minuteness of the engraving and the details added for the purpose of preventing forgery, instead of using watered paper, a precaution adopted by many governments, though it may be easily pointed out how imperfect a guarantee it offers, being no longer visible when once the stamp is fastened on the paper, so that in fact paper without any watering at all would answer just the same purpose. Such being the case, the exhibitor studied how to substitute for the watering, only visible at the back of the stamps, microscopic markings engraved on the embossed surface.

367 RESTELLI, ANGELO, engraver, 20, via di Po, Turin.—Frames containing seals and stamps printed in colours.

368 RICCO, FELICE, Modena.—Atlas of 72 specimens of nature printing on different metals. M., Dublin, 1865.

The process of nature-printing, improved by the exhibitor, has been many years before the public. It consists simply in placing the substance which it is desired to copy between two sheets of metal, and then subjecting them to pressure between rollers. The exhibitor has succeeded admirably in copying objects presenting an almost flat surface, such as drawings, crystallizations, leaves, cloth, ribbands, &c.

M. Auer, of Vienna, some years ago, found out a process for printing on sheets of lead, but was obliged to resort to electrotypes in order to obtain many copies. By Ricco's method, on the other hand, the impressions are taken directly from the plate itself, either with ink or colours: the metal surface being still clear and accurate after having printed several thousand copies.

369 SERA, CHEF. BARTOLOMEO, Turin.—Programme of the professional and industrial instruction adopted in the technological and special schools dependent on the Minister of Agriculture, Industry, and Commerce.

370 LANCIA FEDERICO, Duke of BROLO, Palermo.—Publications of the exhibitor, viz.:—Statistics of the Communal Schools in Palermo in 1854; of the Public Instruction in Palermo in 1859; of the Deaf and Dumb in Sicily, 1863; of the Communal Schools in Palermo, 1863; of the Infant Asylum in Palermo in 1862.

371 ROLLA, LEON, via S. Felice, Turin.—Statistical military diagram of central Europe and other specimens of autography.

### SECTION XVIII.—WOVEN, SPUN, AND LAID FABRICS, SHOWN AS SPECIMENS OF PRINTING OR DYEING.

[Number of Exhibitors 3. Of these 3 obtained prize medals at the Italian Exhibition in 1861, and 3 at the International Exhibition in 1862; at the Dublin International Exhibition in 1865, 2 received medals and 1 an honourable mention.]

**375 BRUNI, FRANCESCO**, dyers, 4229, *via di Rugabella, Milan*.—Organzine and tram dyed various kinds of black. M., Florence, 1861; H. M., London, 1862; M., Dublin, 1865.

**376 FOLETTI, WEISS, AND Co.**, dyers, 8, *via S. Nazario alla Pietrasanta, Milan*.—Cotton water yarn, dyed Turkey red. M., Florence, 1861; M., London, 1862; M., Dublin, 1865.

**377 HUTH, PIETRO**, silk dyer, *Como*.—Silk dyed black. M., Florence, 1861; M., London, 1862; H. M., Dublin, 1865.

This manufactory, which dates from 1854, has been considerably enlarged and improved, and all the machinery changed. At the present time there is a boiler of 25-horse power, made expressly, a steam pump, and two machines for lustring the silk, of which one is moved by power.

The continually increasing produce, which may be taken on an average at 18 tons of black dyed silk annually, involves an expense of £640 paid in wages alone to 25 workmen. The exhibitor's untiring exertions, with a view to improve this art, and his constant application to this special branch of dyeing have been crowned with complete success. He it was who first succeeded in finding a process for dyeing in black with increase in weight, so that now he obtains an increase of 50 per cent. with once boiled and lustred silk, and as much as 100 per cent. on those twice boiled.

Besides this improvement may be mentioned the brilliancy of the colour, the permanency of the lustre of the stuffs, and the excellence of the thread, points which attracted the attention of the Jury, both in the Italian Exhibition of 1861, and the London International Exhibition of the following year.

### SECTION XIX.—TAPESTRY, INCLUDING CARPETS AND FLOOR CLOTHS, LACE AND EMBROIDERY, FANCY AND INDUSTRIAL WORKS.

[Number of exhibitors, 7. Of these 1 obtained a prize medal at the Italian Exhibition in 1861, 1 a medal and 1 an honourable mention at the International Exhibition in 1862; 3 obtained medals and 1 an honourable mention at the Dublin International Exhibition in 1865.]

**382 BALLAURI, MARINA**, born *CASAREGGIO, Savona, (Genoa)*.—Embroidered cambric handkerchief, price £4.

**383 BIELLA, ANTONIO**, manufacturer, *1 via dei Rastrelli, Milan*.—Alto rilievo embroidery in gold, on red silk ground; an infant; a vase, price £10. M., Dublin, 1865. The exhibitor obtained medals from the Lombard Institute of Science, Letters, and Arts in 1857 and 1861, as well as from the Fine Arts Academy.

**384 BUONINI, MARIANNA**, *Lucca*.—Pincushion, scallop, square piece, in imitation of ancient lace. M., Florence, 1861. Lace made with a common needle; an art supposed to have been lost since the 15th century.

Lace handkerchief, price £2 16s.

Insertion lace, 11s. per yard.

Specimens of Paris and Rotella points.

**385 FRATTI, ROSINA**, *Reggio (Emilia)*.—Portfolio with embroidered designs, executed by a little girl of 14 years of age; price £12. M., Dublin, 1865.

**386 FUMMO, MARIA**, 178 *strada Toledo, Naples*.—Embroidered cambric handkerchief, representing various Chinese costumes (purchased by the Baroness de Rosa). Embroidered handkerchief representing the four quarters of the world (purchased by Sig. Raffaele de Martini).

**387 LEVERA BROTHERS**, manufacturers, *via Po, Turin*.—Fringes for furniture; cord and two tassels in white and blue silk, £2 12s.; ditto crimson and gold, £2 16s. H. M., Dublin, 1865.

**388 MARTINI, LUIGI**, late *GIUSEPPE, 4014 via Speronari, Milan*.—Gold and silver silk brocade and embroidery. M., Florence, 1861; M., London, 1862; M., Dublin, 1865.

The subjects of the two embroidered pictures are the "Last Supper" and the "Supper" at Emmaus, both remarkable for their precision and the exquisite needlework, as well as on account of the difficulty overcome in harmonizing the various tints of the silk with the chiaro-scuro gold and silver, so as to produce proper gradation of colours. Embroidery suited for Roman Catholic churches, and pictures of two doctors of the law in chiaro-scuro gold to imitate relieve.

Two basso-relievos representing a candlestick and various ornaments in gold in imitation of engraving; also several costly priests robes.

**389 TACCHINI, MARIA TERESA**, *Modena*.—Cambric handkerchief embroidered with refe. H. M., London, 1862.

### SECTION XX.—ARTICLES OF CLOTHING FOR IMMEDIATE PERSONAL OR DOMESTIC USE.

[Number of Exhibitors, 7. Of these 5 obtained prize medals at the Italian Exhibition in 1861, and 3 at the International Exhibition of 1862; at the Dublin International Exhibition in 1865 2 received medals and 1 an honourable mention.]

**394 ARNALDI, GIORGIO**, *Mondori Breo (Coni)*.—Patterns for tailors. M., Florence, 1861.

**396 BOSSI, EDOARDO**, glove manufacturer, 179 *strada Toledo, Naples*. Price per dozen:—

Sheep skin gloves, 8s. 6d.; machine made Neapolitan lamb skin, 12s. 9d.; machine made Sicilian lamb skin, 15s. 3d. double buttoned, 19s. 3d.; embroidered, £1 4s.; machine made children's lamb skin, 10s. 7d.; machine-made embroidered ladies' gauntlets, £1 1s. 10d.; stitched Sicilian lamb skin, £1; fancy ditto, £1 1s. 9d.; embroidered ditto, £1 6s.; embroidered stitched Sicilian lamb skin, £1 15s. 2d.; machine made Sicilian kid, £1 8s.; double buttoned, £1 12s.; embroidered ditto, with gauntlets, £2; stitched and embroidered Sicilian kid, £1 14s. 6d.; stitched and embroidered dyed kid, £1 14s. 6d.; dyed lamb skin, 16s. 6d. M., Florence, 1861; H. M., London, 1862; M., Dublin, 1865.

**397 CONTI, CESARE**, late M., straw plait manufacturer, 8 *Jacopino, Florence*.—Collection of Tuscan straw hats, 8s. to 12s.; straw plait, fancy trimmings, cigar cases, and other manufactures in straw. M., Florence, 1861; M., London, 1862; M., Dublin, 1865.

**398 LUBINI, ANTONIO**, manufacturer, *Sienna*.—Felt hat made with hares' fur, price 8s.; felt hat, 7s. 3d. M., Florence, 1861. This manufactory was founded in 1820; about 3,000 hats are turned out yearly, those exhibited being of average quality.

**399 PONZONE, ANTONIO**, manufacturer, *via Santa Margherita, Milan*.—Stiff and flexible silk and felt hats; military hat. H. M., Dublin, 1865.

**400 TAVERNA, VERONICA**, glove manufacturer, *Piazza Castello, Turin*.—Ladies' and gentlemen's gloves and mittens.

**401 PELLERANO, GIOVANNI BATTISTA**, 193 *a Chiaja, Naples*.—Gloves.

### SECTION XXI.—CUTLERY AND EDGE TOOLS.

[Number of Exhibitors, 1. Prize medal at the Italian Exhibition at Florence in 1861, the International Exhibition of 1862; and the Dublin International Exhibition in 1865.]

**410 SELLA, LUDOVICO AND BROTHERS**, manufacturers, *Masserano (Novara)*.—Collection of cutlery.

## SECTION XXII.—IRON AND GENERAL HARDWARE.

[Number of Exhibitors, 6. Of these 1 obtained an honourable mention at the International Exhibition of 1862; and at the Dublin International Exhibition in 1865 1 received a medal and 1 an honourable mention.]

413 ARUNDO, GIOVANNI, *Salerno (Principato Citrinore)*.—Safety lock, price £60. H. M., Dublin, 1865.

414 BOLZANI, SAVERIO, manufacturer, 28 *Borgo di Cittadella, Milan*.—Metallic wire gauze. H. M., London, 1862; M., Dublin, 1865.

415 GRAZIOLI, FORTUNATO, 3 *via dei Vetraschi, Milano*.—Improved bit for riding horses.

417 OTTINO, GIACINTO, manufacturer, *Piazza Certignano, Torino*.—Zinc work: royal arms of Italy hammered in zinc, price £12; ditto coloured and gilt, £6; ornamental cornice in zinc; statuette of King Victor Emmanuel, 16s.; statuette of Garibaldi, 16s.

418 SAJNO, FRANCESCO, 3217 *via dei Profumieri, Milan*.—Improved coffee pot acting by steam pressure for coffee houses, price £7 16s.; for family use, £1 10s. and £1 4s. Copper coffee pot coated with improved anti-rust metallic enamel, invented by exhibitor, £1 16s.

The exhibitor obtained two medals for these inventions from the Royal Lombard Institute of Science, Letters, and Arts.

449 SALVI, PASQUALE (late NICOLA), manufacturer, *S. Potito (Principato Ulteriore)*, and *Teano (Terra di Lavoro)*. Office in *Naples*, 25 and 26 *Strada Nuova Murina*.—Castings of agricultural implements; plates for forming gun barrels.

## SECTION XXIII.—WORKS IN PRECIOUS METALS, AND THEIR IMITATION; JEWELLERY AND ALL ARTICLES OF VERTUE AND LUXURY, NOT INCLUDED IN OTHER CLASSES.

[Number of Exhibitors, 16. Of these 2 obtained medals at the Italian Exhibition in 1861; and at the Dublin International Exhibition one received a medal, and 6 honourable mentions.]

423 BIANCHI, BREXEDDETTO, *Pescola (Macerata)*.—Bacchanalian engraved on cornelian, £8; Flora, engraved on a pink stone, £8. M., Florence, 1861.

424 BRUCCI, GIUSEPPE, manufacturer, *Florence*.—Statuettes and ornamental work in serpentine from *Prato (Florence)*.—

	Price.
1 Large oval tazza with handles supported on a column, from the antique, . . . . .	£ s. 32 0
2 Tazza with vine branches, smaller than the above, . . . . .	15 0
3 Round tazza with bells, . . . . .	10 0
4 Pair of lions, from the antique, . . . . .	9 0
5 Wild boar, from the ancient Greek original, under the Loggia of Orgagna, . . . . .	10 0
6 Smaller size, . . . . .	8 0
7 Pair of dogs, from a Greek original in the Florence gallery, . . . . .	10 0
8 Farnese bull, . . . . .	6 10
9 Lion, from the antique, . . . . .	5 0
10 Large pair of lions, after Canova, . . . . .	10 0
11 The Knife Grinder, reduced from the statue in the Galleria degli Uffizi, at Florence, . . . . .	10 0
12 Pair of basins on pedestal, from the antique, . . . . .	20 0
13 Piranese tazza, supported on a column, from the antique, . . . . .	8 0
14 Venus, after Canova, statuette in marble, . . . . .	30 0
15 Infant, after Donatello, statuette in marble, . . . . .	12 0
16 Wild boar, same as No. 5, smaller size, . . . . .	4 0
17 Tomb of Scipio, from the antique, . . . . .	10 0
18-21 Pairs of dogs, from the antique, same as No. 7, smaller size, . . . . .	2 0
22, 23 Pair of lions with ball, from the antique, . . . . .	2 10
24, 25 Two smaller size, . . . . .	1 10
26 Tazza with three swans on feet, from the antique, . . . . .	5 0

27 Pair of basins, from the antique, same as No. 12, smaller size, . . . . .	£ s. 15 0
28 Two pair of dogs, from the antique, same as No. 7, smaller size, per pair, . . . . .	1 0
29 Three pair of lions with ball, same as No. 22, smaller size, per pair, . . . . .	0 10
30 Wild boar, same as No. 5, smaller size, . . . . .	1 0
31 Oval tazza with serpent handles, supported on column, from the antique, . . . . .	25 0
32 Tazza with three curves, from the antique, existing in the Florence Gallery, . . . . .	0 10
33 Pair of oval tazze, from the antique, . . . . .	1 10
34 Oval tazza, with shells, from the antique, . . . . .	1 10
35 Pair of oval tazze, from the antique, . . . . .	0 10
36 Pair of vases, Medicean form, with head, from the antique, . . . . .	5 0
37 Tazza with three curves, same as No. 32, smaller size, . . . . .	0 10
38 Large bath, with head, from the antique, . . . . .	2 10
39 Ink stand, with dog, . . . . .	0 10
40 Round inkstand, from the antique, . . . . .	0 10
41 Rape of the Sabines, after Gian Bologna's group in the Loggia dei Lanzi, Florence, on pedestal, . . . . .	12 0
42 The Centaur, from the group by Gian Bologna, on pedestal, . . . . .	8 0
43 Small bath, Etruscan form, . . . . .	0 10
44 The Swiss Lion at Lucerne, after Thorwaldsen, . . . . .	3 10
45 Pair of Piranese vases, with cover, . . . . .	2 0
46 Four pair of small tazze with lizards, after Benvenuto Cellini, . . . . . each,	0 5
47 Pair of small fluted tazze and a nicchiellina, . . . . .	0 10
48 Three nicchielline, from the antique, . . . . .	0 10
49 Three lizards, from the antique, . . . . .	0 10

H. M., Dublin, 1865.

425 BILLOTTI, DR. PIETRO, 1 *vicolo del Gianduja, Turin*.—Water colour miniature paintings executed on marble:—Mary Magdalene washing the feet of our Saviour, from the painting by Paolo Veronese, £40; Pietro Micca in the act of blowing up the citadel of Turin, at the period of the siege by the French, in 1706, from the painting by Gastaldi in the City Fine Arts Gallery, Turin, £12; Lucia waiting for Rienzo, suggested by Manzoni's novel of *Promessi Sposi*, £12; The family of Charles I., King of England, after Vandyke, £20. H. M., Dublin, 1865.

426 CARLETTI, DOMENICO, *Florence*.—Fibula Pietry; basso rilievo, £1 12s.; ivory basso rilievo ornament on ebony ground, 16s.; cameo portrait of H. M. King Victor Emanuel, in ivory, 16s.

427 CASTALDI, VINCENZO, manufacturer, 11 *strada Gigante, Naples*.—Lava and coral work. Price £1 each:—Jupiter; Garibaldi; Bacchaulian, after Canova; Bacchus; Ecce Homo.

428 CERIANI and BROTHERS BARZAGHI, founders, 6 *via della Moscova, Milan*.—Bronzes cast by the process of *cire perdue*:—The Reading Girl, reduced from Maggi's statue; Dante, from Prof. Vincenzo Vela's bust, £60; a hand with flowers, modelled from nature, £12; engraved and gilt bronze cup and saucer, £60. H. M., Dublin, 1865.

The exhibitors received a silver medal from the Lombard Institute of Science, Literature, and Arts in 1863, for having revived in Milan the art of casting by the process of *cire perdue*.

429 ERCOLANI, EMILIO, *Florence*.—St John, after Donatello; repoussé metal work. Price, £20. M., Florence, 1861; H. M., Dublin, 1865.

430 GUIDA, LEONARDO, *Tripoli*.—Cameos:—The chariot of Alexander, £9; Galileo, £8; Pythagoras and Fluvio Gioia, two cameos for carriages, £2. Coral ornaments:—Jupiter and Ganymede, £5; Infant under a tree, £3 3s.

431 JEANS, JOHN J. British Vice-Consul, *Catania*.—Amber necklace, consisting of 21 large flattened beads and 22 small ones.

This gentleman offers considerable mineralogical

interest, the amber being found on the banks of the Simeto, a little river watering the plain of Catania. The specimen shows various colours of this rare substance; bright red, wine red, reddish yellow, and blueish. It was manufactured at Catania, and is the property of the exhibitor.

**432 LAULICINI, GIUSEPPE**, 268 *Riveri di Chiaja, Naples*.—Collection of cameos on Indian shells:—Night and day, £3; The Virgin and Child, after Carlo Dolce, £4; Flora (original design), £2 8s; Flora, from the antique, £2 8s; Marriage of St. Catherine, after Correggio, £4; Bacchanalian (original design), £2 8s; do. from a fresco found at Pompeii, £2 8s; Peace, £2 8s; Bacchanalian, £2 8s; Medusa, £2; Aurora, £2; Ceres, £1 12s. H. M., Dublin, 1865.

**434 MARTUCCI, GIUSEPPE**, manufacturer, *Strada Gigante, Naples*.—Arabesque coral handle for a parrasol, dagger, knife, &c., 8 inches long, carved in relief, out of a single piece, with fruit, animals, leaves, &c. Price, £72.

**435 MUSSOLINO, SALVATORE**, 19 *Vico Colonna, a Pontenuovo, Naples*.—Carved wooden vase, with figures, £8; two vases, £12. H. M., Dublin, 1865.

**436 STELLA, GIOVANNI**, 12 *vico 2<sup>o</sup> Montecalvario, Naples*.—"Lava" work, representing:—The Farnese bull, £60; ditto, small size, £6; the goat Amalthea, from a Pompeian fresco in the National Museum, £2 8s; Head of Jupiter crowned with laurels, £2 8s; Cage of Cupida, from a fresco in the National Museum, £2 8s; Medusa, £3 4s; Head of Jupiter Capitolinus, £2. M., Dublin, 1865. The stone known commercially in Naples as "lava," is a kind of argillaceous limestone or lithographic stone, which has a very fine grain, and is admirably suited for fine carving; it has not the slightest connexion with Vesuvian lava.

**437 MENICI, ANGELO**, *Leghorn*.—German silver frame, with open work and ornaments, containing basso relievos of Dante and Ariosto, entirely hammered out of a single plate of metal.

**438 JODI, CASIMIRO**, *Reggio d'Emilia*.—Large collection of antiquities of various epochs; Roman medals; bas reliefs; seals; lamps; bronze statuettes, &c.—(Shown in the Medieval Court. See No. 760A, p. 299).

**439 TARI, GIUSEPPE**, 21 *Figarella, Montecalvario, Naples*.—Cameos:—St. Paul, £2 10s; St. Peter, £2 10s; Michael Angelo, £2 10s; Galileo, £2 10s.

#### SECTION XXIV.—GLASS.

[Number of Exhibitors, 1.]

**440 SANESI, MIROPE, and SON**, manufacturers, *Pescia (Lucca)*.—Covered glass vase, cup and saucer in imitation chalcidony; blue glass cup and saucer; imitations of antique vases in coloured glass; glass for the manufacture of beads.

#### SECTION XXV.—CERAMIC MANUFACTURES, CHINA, PORCELAIN, EARTHENWARE, &c.

[Number of exhibitors, 15. Of these 3 obtained prize medals at the Italian Exhibition in 1861, and 2 at the International Exhibition of 1862; at the Dublin International Exhibition of 1865 2 received medals and 2 honourable mentions.]

**442 BONI, ANDREA**, manufacturer, 8 *fuori Porta Garibaldi, Milan*.—Terra cotta work, prices in Milan:—Monument, £120; chimney piece; pedestal, £2 8s; cornice, 8s; satyr, £5 4s; Bacchanalian (statue), £5 4s; Agriculture, ditto, £5 4s; Garibaldi (statuette) at Marsala, raising his sword and swearing not to replace it in the scabbard until Italy was free, £16; Italy (bust), £1 4s; Galileo, ditto, £1; Volta, ditto, £1; group for a fountain, £4 16s; ditto, £3 12s. M., Dublin, 1865.

**443 CATANIA SUB-COMMITTEE FOR THE DUBLIN INTERNATIONAL EXHIBITION**.—Six coloured figures, manufactured by Nunzio Giuffrida and Angelo Leone, at Catania, representing the costumes of the country. Larger size, 5s. each; small 3s. each.

**444 CISELLI, Dr. GIUSEPPE**, *Certaldo (Florence)*.—

Basso rilievo, imitation Luca della Robbia ware. Price £12. The exhibitor, a medical man in practice, never studied the fine arts, but takes much pleasure in making these imitations, which he sells at a very reasonable price.

**445 COLONNINI, GASTANO**, manufacturer, 20, *strada Marinella, Naples*.—Enamelled tiles of various patterns for pavements. £1 12s. to £4 per 1000. M., London, 1862.

**446 GIUSTINIANI, ANGELO**, 20, *strada Gigante, Naples*.—Pottery vase, Caltagirone style, price £12; pottery vase, Abruzzo style, £8; saucer representing Pompeian mosaic, £2 12s. M., Dublin, 1865.

**447 JODI, CASIMIRO**, *Reggio d'Emilia*.—Large collection of antiquities.—(See 438, Section XXIII.)

**448 MAJURINO, VINCENZO**, 7, 8, 12, and 17, *strada Marinelli, Naples*.—Earthenware seat, Egyptian style, £2.

**449 MOLLI, GIOVANNI**, manufacturer, 27, *strada Santa Lucia a mare, Naples*.—Two imitation Abruzzo vases, £8; Two imitation Etruscan vases; twenty Terra cotta figures from originals in the National Museum:—Silene, £1 4s; Pan and Apollo, 12s; Farnese Hercules, Dancing Faun, Hercules Strangling the Serpent, Mercury Reposing, and Aristides, each, 5s; Venus and Cupid, and Bacchus and Cupid, each 8s; bust of Caracalla and bust of Lucius Verus, each 2s. 6d.; four imitation Etruscan vessels; design painted on tiles, from Pompeian frescoes. M., London, 1862; H. M., Dublin, 1865.

**450 MUNICIPALITY OF CORTONA, Arezzo.—Two engravings of an Etruscan lamp; of two Etruscan statuettes; photograph of the Muse Pollinia, a Greek painting executed on slate; photographs, the originals existing in the Etruscan Academy at Cortona; lithograph of a Greco-Roman sarcophagus, now placed in the cathedral of Cortona.**

**451 OLIVIER and FERRO**, manufacturers, *Savona (Genoa)*.—Plaster of Paris pipes. M., Florence, 1861.

**452 PAZZONI, CESARE**, manufacturer, *Traversetolo (Parma)*.—Pavement in tiles of various colours.

**453 PEPI, BERNARDINO**, *Sienna*.—Table top in terra cotta, glazed and painted in the style of the seventeenth century. M., Florence, 1861.

**454 SPREAFICO BROTHERS**, late GIACOMO, manufacturers, 12, *Cordusio, Milan*.—Samples of decoration on Italian earthenware.

Everyone knows the artistic merit of the ancient Italian earthenware, or *Paenza ware*, and the reputation in which it is held, causing it to be sold for fabulous prices, notwithstanding which this art has been too much neglected for centuries, and allowed to decline.

The exhibitors have carried on for many years an extensive trade in china ware, and in 1863 turned their attention to the decoration of earthen and stone-ware, porcelain and glass, which, in a great measure, were obtained from abroad.

This experiment, diligently followed up, and properly studied, so far succeeded that during the course of the first year the exhibitors obtained a silver medal from the Royal Institute of Science, Letters, and Art, for their decorations. The business has since been considerably extended, and employs a great number of persons. The articles exhibited at Dublin show the variety of the work executed, embracing specimens of decoration in the ancient style, that of the middle ages, and modern earthenware.

**455 VACCARO, BONGIOVANNI**, *Caltagirone (Catania)*.—Terra cotta figures.

**456 RICHARD, GIULIO, and Co.**, manufacturers, *S. Cristoforo, Milan*.—Specimens of decorated porcelain; large stoneware vases, with serpent handle, metallic glaze; garden vase and saucer; vase, goat's head pattern; cup and saucer richly ornamented, similar to a set made for H. M. Maria Pia, Queen of Portugal; different patterns of cups, half decoration; plate, martinet and wild rose; plate, with grapes; richly ornamented porcelain plates; common plates, fillet borders; two

transparencies; eight stoneware plates, decorated in chromo-lithography. M., Paris, 1855; M., Florence, 1861; M., London, 1862.

[The objects of this exhibitor arrived after the jurors had concluded their work, so that, unfortunately, they could not compete for the medal.]

This manufactory, founded in 1842, on the most modest scale, by its present proprietor and director, M. J. Richard, is close to S. Cristoforo, a suburb of Milan on the Neviglio grande, and has already assumed such importance as to merit a brief notice. At the present moment the whole population of S. Cristoforo may be said to be employed by M. Richard, and indirectly that of the neighbouring places likewise, in the carriage of wood, fuel, clay, &c. It is highly instructive to see that, in so far as occupation and intelligent labour contribute to moralise a people, the inhabitants of S. Cristoforo, formerly indifferent and lazy, have been completely transformed by the progressive development of the manufactory. Want, misery, and dissolute habits, have given place to order, ease, and regular active life—in a word, the civilising influence which has been brought to bear upon these once neglected peasants reflects the greatest credit on the worthy proprietor of the establishment.

It will suffice for our purpose to sum up the statistics of the products by stating that the manufactory turns out three and a-half millions of articles of daily utility, of the greatest variety of form, by the sale of which, alone, it is supported. These products are extensively known throughout the kingdom, both on the mainland and in the islands. Almost all the raw materials employed here, as well as the fuel, are procured in the country, whence a source of wealth which deserves consideration. For the use of that part of Northern Italy, in place of coal, M. Richard has devised an improved form of furnace, by which he obtains any amount of heat he requires.

There is, however, a brighter prospect to be taken of the establishment, to which we earnestly call the attention of our manufacturers—we refer to the care taken of the workmen. To the exhibitor is due the no small honour of introducing, for the first time, into Italy, a Mutual Aid Society, embracing all his men. An elementary school is provided for the children, and an infant asylum, in which the little ones are taken care of while the parents are at work—all which institutions originated with the establishment. An important addition has been made lately by the erection of a block of dwelling-houses for the families of the workmen, where they have the advantage of a reading room, wash-houses, and a large kitchen for general use. In fact, the village of S. Cristoforo presents features of no common importance, rendering it worthy of the visit of those engaged in industrial pursuits.

#### SECTION XXVI. — DECORATION, FURNITURE, AND UPHOLSTERY, INCLUDING PAPER HANGINGS, PAPIER-MACHE, AND JAPANNED GOODS.

[Number of Exhibitors, 13. Of these 2 received a prize medal at the Paris Universal Exhibition in 1855; 5 at the Italian Exhibition in 1861; and 5 at the International Exhibition in 1862. At the Dublin International Exhibition in 1865 11 received medals and 6 honourable mentions.]

**459 BAZZANTI, PIETRO, and SON, manufacturers, Florence.**—Mosaic Pietre dure table, representing the Adrian tazza with four doves, executed in yellow chalcidony and white agate, on black Belgian Lydian stone ground, with rococo border of flowers and fruit in amethyst and lapis lazuli; on inlaid and gilt legs; price £320. M., Florence, 1861; M., Dublin, 1865.

**460 CALVI, ANTONIO, manufacturer, 33 Corso Vittorio Emanuele, Milan.**—Carved wood and ornamental composition frames; strips of carved wood and composition for making frames, coloured so as to resemble gold

by a process invented by the exhibitor. H. M., Dublin, 1865.

**461 CANTIERI, FRANCESCO and VIRGILIO, manufacturers, Lucerne.**—Lady's work-table, inlaid with ivory; mother-o'-pearl, and metal. M., Dublin, 1865.

**462 DESCALZI, GIACINTO, Chiavari (Genoa).**—Chiavari chairs. M., Florence, 1861; H. M., London, 1862. The manufacture of Chiavari chairs originated in 1806 with the late Gaetano Descalzi, surnamed "Campanino," and they are now known all over Europe.

The pattern of these chairs was brought from Paris by the Marquis Stefano Rivarolo, promoter, and it may be said founder, of the Economical Society at Chiavari. This society was instituted in 1791, and held an Exhibition of local agricultural products and manufactures in 1793, that is to say, four years before the first Paris Exhibition of 1797, made by François de Neufchâteau, Minister of the Interior. Campanino improved those considerably, so that they were soon exported to Paris itself, and Canova declared that the inventor of Chiavari chairs had solved the problem of combining lightness with strength.

The woods employed in their manufacture are cherry, walnut, and sycamore; the seat is made of willow, woven according to the price. It is estimated that 14,000 are made annually, employing in their manufacture 150 artisans in the town, besides 50 peasants in the mountains, to fell the trees and saw the wood. 60,000 common beechwood chairs, with rush seats, are likewise annually made at Chiavari, employing 180 workmen. These are sold at 1s. 2d. each.

**463 FONTANA, DOMENICO, cabinet-maker, 9 Borgo di Porta Venezia, Milan.**—Ebony cabinet, inlaid with ivory; on the front a copy of the Dance of Cupids, after Albani, engraved in ivory, £120.

**464 FRULLINI, LUIGI, sculptor in wood, Florence.**—Carved walnut wood chest, ornamented with figures and group representing a boar hunt, cinque-cento style (original design); price £24. Two ornamental gilt consoles, modern style (original design); price, each, £8. M., Florence, 1861; M., London, 1862; M. Dublin, 1865.

**465 CAJANO, EGISTO, Florence.**—Sculptured walnut wood frame, Florentine, cinque-cento style, price £60. M., Dublin, 1865.

**466 GABUTTO, ALMERICO, Sorrento (Naples).**—Inlaid work; mosaic table in wood, £40; inlaid book shelves, mosaic box, and inlaid and ornamental box, each £10; four small inlaid boxes £4. M., London, 1862; H. M., Dublin, 1865.

**467 GATTI, GIOVANNI BATTISTA, Rome.**—Inlaid ebony cabinet, style of the 15th century, with arabesques engraved on ivory; inlaid ebony table-top with arabesques and medallions engraved on ivory; carved ebony frame, £16; M., Paris, 1855; M., London, 1862; M., Dublin, 1865.

The exhibitor, a native of Faenza (Forlì), has had for the last twenty years two establishments in Rome; one in the Via degli Angeli Custodi, No. 30, the other in the Palazzo della Cancelleria, where he manufactures costly furniture of every kind, inlaid with ivory, oriental mother-of-pearl, tortoiseshell, and wood, coloured and shaded by the application of heat. His chief success is in cinque cento furniture, modelling the ornaments, flowers, arabesques, figures, &c., after the works left by such great masters as Raffael and Michel Angelo.

Gatti's manufactory is the only one of the kind in Rome, where the practice of this art had been long lost until he restored it. He gives employment to twelve persons, of whom two are engravers, one a worker in silicious stones, two carvers in wood, and two in ivory, the rest performing the more ordinary part. The specimens he exhibited at London in 1862 and those he presented at Dublin are of such a classical character, the harmony of the colours so perfect, and the inlaying so carefully executed, that they might stand in a palace beside the works of the most celebrated mediæval artistic manufacturers.

**466 LANCETTI, FEDERICO**, cabinet manufacturer, *Perugia (Umbria)*.—Ebony table top, inlaid with various kinds of woods, mother-of-pearl, ivory, and metal; style of the 15th century. M., Florence, 1861; M., London, 1862; M., Dublin, 1865. Manufactory established in 1845, employing about 20 workmen, besides the inlayers and upholsterers, who work out of doors.

As long ago as 1843 the exhibitor attempted to restore in Perugia the art of inlaying in wood, copying the ancient works existing in that city, and studying to facilitate their reproduction, as well as to dye and shade woods in imitation of silicious stones, by chemical processes, yet so as in no degree to injure their structure, although the colour should be made to penetrate the substance. The admirable manner in which he has realized his point will be seen by the specimens he has already produced.

In 1846 Lancetti opened a manufactory of common and inlaid furniture at Perugia, which has increased in extent up to the present time; he now employs about twenty workmen, including carpenters, cabinet-makers, turners, and inlayers. These execute all kinds of work from the most rough carpentry to the finest cabinets inlaid with ivory. Several of his pupils have since set up for themselves, both in Perugia and in the neighbouring towns.

In 1853 he was commissioned to restore the inlaid work of the celebrated Choir of St. Peter in Perugia, designed by Raffael, and executed in the fifteenth century; and now the Collegio della Mercanzia, at Perugia, have intrusted him to restore the Hall of Audience, an unique specimen of art of the thirteenth century, lined entirely with inlaid wood. Lancetti obtained a medal at Florence in 1861, for a table inlaid in woods of various kinds, mother-of-pearl, and ivory, which was purchased by the King.

**469 LEVERA BROTHERS**, manufacturers, *via Torino, Turin*.—Carved walnut wood furniture:—Solid walnut wood; expanding dining table for 35 persons, with richly carved foot and improved arrangement for drawing in and out, £56; carved walnut wood chandelier for 40 lights, £40; richly carved walnut wood sideboard, with bas-reliefs representing hunting trophies, and mirrors in the panels, £44; gilt chair, covered with silk, £5 12s.; carved walnut wood chair, with ebony ground, and covered with silk, £2 16s.; carved walnut wood sofa, with ebony ground, and covered with silk, £16; richly ornamented entrance door to a house complete, with plate glass centro panel and panels carved in bas-relief, exhibited as a specimen of architectural decoration, £54. M., Paris, 1855; M., Florence, 1861; M., London, 1862; M., Dublin, 1865.

The exhibitors set up in Turin on a very small scale in 1859, and by their energy and economy acquired sufficient capital to extend their operations, until they have founded an establishment unequalled in Italy by anything of the kind in point of size and efficiency. They competed at the Piedmontese Exhibition, held in Turin in 1854, and in 1861 they made a most brilliant display at Florence, from whence many articles were sent to the International Exhibition of the following year; and on all these occasions they obtained prize medals. The principal piece of furniture sent to London was a grand book case, unfortunately destroyed by a fire which took place in the manufactory in 1863. Nine of Messrs. Levera's workmen received prizes at the Florence Exhibition. Finally, this house obtained the gold medal offered by Chev. Genaro, to be awarded to such persons as should have made most improvements in their establishments during the two preceding years by enlarging the field of their exertions and introducing more economical processes of manufacture.

On all these occasions Messrs. Levera were highly commended for the good execution, accurate design, taste, and elegance of their furniture. They sent some articles to Dublin which will undoubtedly contribute to uphold the credit of Italy as well as of Turin.

The manufactory is situated in the quarter of Van-

chiglia, and consists of a large block of buildings and yards, in which are carried on all the varied branches of their industry, which besides embracing every kind of furniture, fringes, and tassels, contains a model room and foundry for making ornamental bronzes, such as lamps, candlesticks, chimney ornaments, &c., like those of Paris. The works are provided with a steam engine, setting in motion the machinery for cutting veneer, sawing, planing, moulding, &c., and a school of design is attached to the workshops, in which the carvers copy casts of classical subjects, so as to facilitate them in producing objects in harmony with the rules of art.

One of the brothers superintends the manufactory, another undertakes the charge of the machinery and the buildings themselves, while the third attends to the decoration and out door business. Messrs. Levera are provided with the following master workmen: inlayers in wood, carvers, modellers, brassfounders, engravers in metal, blacksmiths, turners in iron, brass, and wood, gilders in wood and bronze, upholsterers, decorators, painters, paper hangers, &c. In ordinary times 380 men, women, and children are employed on the premises, besides the clerks, warehousemen, and managers. The value of the materials employed is stated by the exhibitors to be £30,000 per annum, which after having been worked up into furniture represents a value of no less than £120,000. It is now proposed to add fresh machinery to that already existing, in order to be better able to execute all the orders coming in.

The principal sale is in Central Italy, in the provinces along the Adriatic coast of the Apennines, in Turin, and the Italian settlements at Cairo, Alexandria, Tripoli, Tunis, Montevideo, &c. Since the Italian capital has been transferred the exhibitors have opened an extensive shop in Florence, still, however, keeping up that at Turin; indeed this change has been a great spur to them bringing in constant orders from a fresh part of the country.

**470 LURASCHI, ANTONIO**, manufacturer 40 *Borgo di Porta Romana, Milan*.—State billiard table, in ebony, inlaid with rosewood and ornamented with brass; marking board and sticks complete, £120. The legs are provided with screws for levelling it without taking it to pieces. H. M., London, 1862; H. M., Dublin, 1865.

**471 MONTERERI, ALESSANDRO**, *Perugia (Umbria)*.—12 pieces of wood, 9 of which in mosaic, the other 3 inlaid, intended to form part of a piece of furniture representing the principal monuments of Italy, with ancient and modern emblems, to be entitled the "National triumphs;" 3 statues representing Power, Justice, crowned by Virtue, to form part of the same. M., Florence, 1861; M., London, 1862; M., Dublin, 1865.

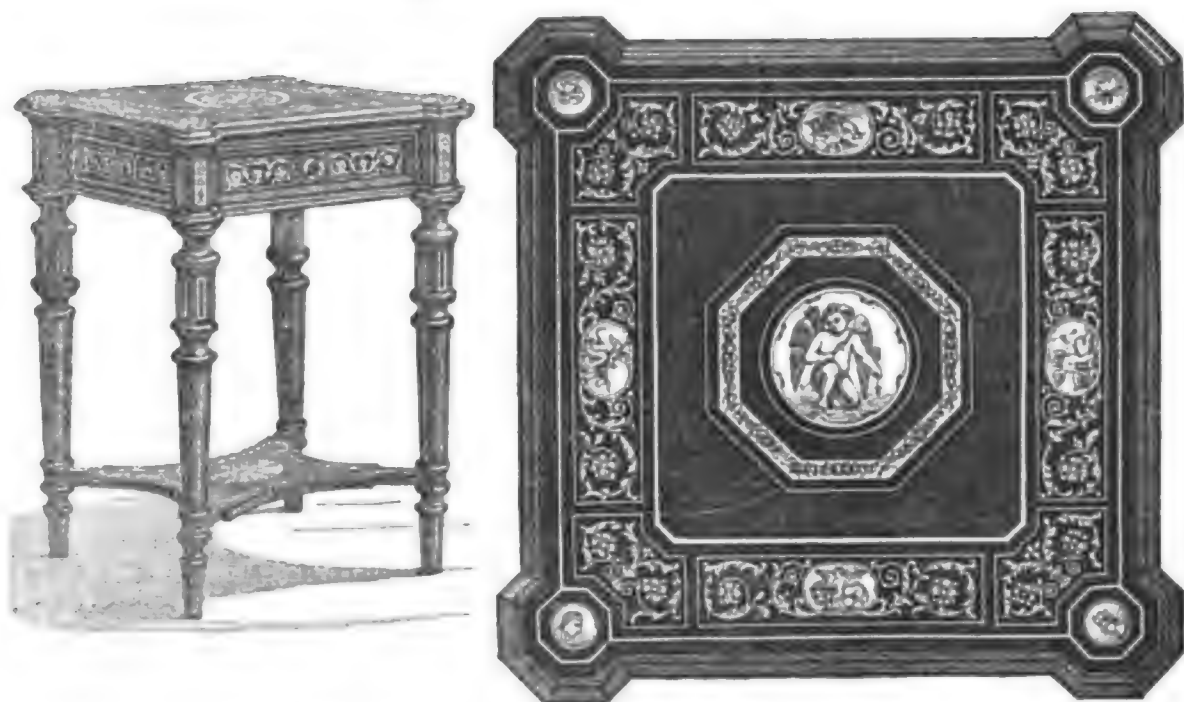
**472 ROYAL ITALIAN COMMISSION**, *Turin*.—The Ponte Nomentano, at Rome; medallion in mosaic, executed by Achille Testi of Rome, belonging to the Ministry of War. Presented by the government to the City Gallery of Fine Arts, Turin.

**473 ROVELLI, CARLO**, manufacturer, 29 *via del Monte Napoleone, Milan*.—Cane and Bamboo chairs, bird cages, flower stands, &c. H. M., Dublin, 1865.

**474 SEVESO, VINCENZO**, manufacturer, 29 *via S. Pietro all'Orto, Milan*.—Ebony table, inlaid with ivory; drawers opening on all sides, price £10; ebony cabinet inlaid with ivory, representing "The Duel" in Manzoni's *Promessi Sposi*, £18 8s.; box of Indian and other woods, richly carved and inlaid with engraved ivory, £20. M. Dublin, 1865. (For illustrations see page 41.)

**475 STIKLER, BARTOLOMEO**, manufacturer, 432 *strada Toledo, Naples*.—Morocco writing and dressing case lined with velvet and silk, price £40. Case of petrified wood, ornamented with oxydized silver, with various divisions; cinque cento style, £16. H. M., Dublin, 1865.

**476 TOMAGNINI BROTHERS**, *Pietrasanta (Lucca)*.—Sienna marble table, with marble foot, £6; marble table, made of *mischio di Levante*, £6. H. M., Dublin, 1865.



Ebony Table with Arabesques in Ivory, by Seveso, Milan.

**477 TORRINI, GIOCONDO and Co.** manufacturers, Florence.—Florence mosaic table with gilt foot, £320; mosaic table, made of various kinds of stones, £32; ditto, representing flowers, ribbands, and pearls, £32; ditto, representing flowers and 2 shells, £20; Malachite and gilt bronze vases, each £12 10s; 2 vases, same style, each £4; box of inlaid wood, bronze and mosaic, £14; 5 boxes of gilt bronze and mosaic, each £8; 2 boxes same style, each £10; 1 ditto, £10; several other cheaper ones, and cups, &c. M., Florence, 1861; M., London, 1862; M., Dublin, 1865.

The manufacture of furniture is extensively carried on in Milan, while in the little towns situated in the upper part of the province a large quantity of common walnut furniture is made at a low price and bought by the upholsterers in the city, who polish it, finishing it with leather, silk, cotton, or woollen stuffs, as may be, and and then sell it in the town and neighbourhood. Next come the manufacturers of a better class of furniture who live in Milan and the suburbs who work in walnut, mahogany, and other choice woods, turning out articles of considerable elegance, and more or less rich according to the taste of the day. This trade gives employment to about 3,500 workmen in the province, at wages varying from 10d. to 18d. in the country, and from 18d. to 2s. 6d. in the town. Milanese furniture is solid, tasty, convenient, and light, combined with extreme precision of work, which renders it more sought after by the wealthy; in fact it is sent to all parts of the kingdom. The cabinet-makers execute the finest inlaid work, representing figures, allegories, emblematical designs and copies of well known paintings, intermixed

with ornaments and carvings remarkable for their good taste, the gracefulness of the lines and accuracy of form. Domenico Fontana and Vincenzo Seveso are among those who enjoy most reputation in this art.

#### SECTION XXVIII.—MANUFACTURES FROM ANIMAL AND VEGETABLE SUBSTANCES NOT BEING WOVEN OR FELTED, OR INCLUDED IN OTHER SECTIONS.

[No. of Exhibitors, 2. Of these 1 received a medal at the Italian Exhibition in Florence, in 1861; 1 received a medal at the International Exhibition of 1862; and 2 obtained honourable mentions at the Dublin International Exhibition in 1865.]

**490 AMBROGIO, GIUSEPPE, Brescia.**—Landscape carved in cork; hat and slipper made in cork; specimen of cork pavement; compensation pendulum for a clock, in cork, unchangeable from atmospheric influences, provided with a sliding regulator consisting of glass tubes filled with shot, which can easily be raised or lowered at pleasure. M., Florence, 1861; H. M., London, 1862; H. M., Dublin, 1865.

**491 CAPASSO, Prof. GENNARO, 33, via Maddalena ai Tribunali, Naples.**—Straw mosaic work. Price, £68. H. M., Dublin, 1865.

This object which, by turning a little handle, alternately represents the Royal Palace at Naples and the interior of a fencing room, received a medal from the Royal Institution for the encouragement of Arts and Manufactures at Naples.

[For Italian Sculpture and Pictures see Fine Arts Section.]

*On the Thermal Springs of Italy, and their Therapeutic and Economic Uses.*

By W. P. JERVIS.

In treating of mineral springs the first desideratum is an easy and natural classification. Many authors have sought rather to render the subject a mystery than otherwise by multiplying the subdivision; we prefer falling into the opposite extreme, in order to group together as much as possible all the waters having an evidently common origin.

The most generally accepted grand groups of springs are—saline, sulphurous, acidulous, and ferruginous or chalybeate. We retain the former three only, because, while they are dependent upon the acid constituent of the water, the other is determined by a base. To be conclusive it is well either to use a classification exclusively by acids or by bases, but by no means to mix them up together—an illogical compromise, which has by some means been tolerated up to the present moment, as though they had any possible relation with each other. It will be evident that, as the acid is the solvent agent, whatever be the nature of the rock through which the water passes, and to which it owes its mineralization, the characteristic types in a given geological district must rather be sought in the acid than in the bases, which may differ materially from each other if the water passes through different strata in the same vicinity. Thus it is that some countries abound with sulphurous springs, while in others these are scarcely known; in other places acidulous springs are a source of blessing to the invalid; and in a third region whatever springs occur may be all saline. In Italy, as we shall soon see, all these groups are extensively distributed from the Alps to the southern shores of Sicily. All the mineral springs of Italy may be said to be typified by the presence of one of three acids—hydrochloric, carbonic, or hydrosulphuric, and on these we shall base our classification, thus:—

*Hydrochloric acid.*—Saline springs; often partaking of the nature and properties of sea water; as a rule fixed.

*Carbonic acid.*—Acidulous springs; evolving free gases in varying proportions, though unaccompanied by an offensive odour, except when hydrosulphurous acid gas, or some other one, be present.

*Hydrosulphurous acid.*—Sulphurous springs; likewise characterized by the presence of free gases in varying proportions, and when this is abundant emitting a very disagreeable and well-known odour.

Having sketched out the broad classification which answers for the geologist, we must subdivide the groups of thermal springs in order to ascertain their therapeutic applications.

Saline waters, properly speaking, contain a large proportion of chlorides of alkaline and earthy bases, and sometimes traces of oxyde of iron; they are invaluable in medicine, both for external use as baths, by which means they exert energetic and beneficial influence in numerous disorders, and taken internally they act as purgatives, from the mildest laxative to the most powerful cathartic. Sometimes they are accompanied by other acids, as carbonates and sulphates.

The presence of a large quantity of sulphates, considerably altering the medicinal properties of the water, has caused Garelli and other distinguished writers to separate them; but in the present paper we would desire to overlook this arrangement.

When the saline springs contain alkaline iodides, and bromides their action becomes considerably modified, and they acquire great importance from their efficacy in overcoming certain lymphatic, glandular, scrofular, and other diseases, besides being endowed with an energy increasing in direct proportion to the quantity of iodides and bromides they contain, so as often to become absolutely dangerous even for external application without the advice of a medical man of experience, although the weight of these salts be relatively insignificant. We shall, for these considerations, retain this as a subdivision of the saline group.

Saline waters in general, containing principally, if not entirely, fixed salts, present the convenience of being easily used, even at a distance from the spring, as they do not suffer decomposition.

Acidulous waters, on the other hand, are subject to the inconvenience of immediately decomposing on coming in contact with the air, and being liberated from the great pressure to which they had been subjected in the rock. The bicarbonates of iron and manganese, converted into simple carbonates through the slight affinity by which the second atom of acid is retained, are soon precipitated in spongy masses, which gradually acquire a dark brown colour, and increase in consistency until they form solid ochreous deposits. The carbonates of lime and alumina—the latter rarely existing beyond a mere trace—are likewise precipitated by the loss of the solvent acid, and from those deposits, often of wonderful extent, which are known in Italy by the name of travertine, constituting in some places building stone of the most excellent nature. The taste of acidulous waters, when drunk at the spring, and before they have undergone any change, is decidedly agreeable and sharp, and they form

eminently digestive beverages. They have a most exhilarating influence on the human economy, and are even dangerous to some delicate constitutions, as they so easily mount up to the brain, and cause cerebral excitement. Their efficacy both externally and internally in the resolution of many painful disorders cannot be too highly appreciated—in the former case for arthritic affections, and in the other for gravel, stone, and calculi; though, as suggested, they are to be dreaded by persons of a certain temperament of body.

The presence of a large quantity of carbonate of iron, purely accidental in a geological point of view, becomes of great importance medicinally. We shall constitute these ferruginous or chalybeate waters into a sub-group under that of acidulous springs, but cannot see sufficient argument for giving them more importance. In taste the chalybeate acidulous waters are styptic, and leave on the tongue a sensation similar to that which would be experienced in drinking a glass of water containing a few drops of ink.

Sulphurous waters form a less definite group than the preceding ones. Owing to the weakness of the hydrosulphurous acid it exerts little solvent power, often none whatever; the sulphides are confined to those of sodium and calcium, while the other mineral and gaseous elements of the water are precisely the same as in the two first groups, with the simple addition of the hydrosulphurous acid gas. The range of temperature of these springs is very considerable; and since, as a rule, they are employed for external use, in baths, it may readily be seen how invaluable is this circumstance, as it would be difficult to heat a bath artificially to a very elevated temperature, so as to contain in solution, at the same time, a large proportion of gas, a *sine quâ non* of the efficiency of natural sulphurous baths in many diseases.

The presence of carburetted hydrogen gas along with the hydrosulphurous acid is a characteristic only seen in a few regions, so as to authorize its being looked upon as a distinct sub-group of the sulphurous springs, the more so as it imparts valuable and special medicinal properties to the water.

Lastly, boracic acid, a substance so closely connected with volcanic phenomena, is traced in the sulphurous springs of a particular region of Italy, and will claim, in like manner, to be classed as a second sub-group.

The presence of organic matter in thermal springs is common, and as this in contact with sulphates undergoes speedy oxydation in the presence of air, the result is the formation of sulphides, which are in their turn decomposed in contact with water, evolving hydrosulphurous acid. It need scarcely be added that these springs are not in their normal condition, but are undergoing decomposition after reaching

the surface; they will not consequently be classed among the true sulphurous springs in any case where they are known to be of the nature referred to. Decomposing waters of this kind exist everywhere, and are to be found in Ireland. They are by no means necessarily mineral springs.

Organic matter occurs extensively in mineral springs, especially those of the sulphurous group. It is sometimes nitrogenous, at other times not; at times it seems to be associated with sulphur. Owing to the difficulty of determining with any degree of precision, each chemist adopts his own vocabulary, one calling it organic matter, pseud-organic, &c., others baregine, glerine, and a perfect array of technical names, all, however, reducible to the three types characterized by the writer, mixed with nitrogen, and the occurrence of sulphur. Organic matter is found in thermal springs of a very elevated temperature; this was noticed by Prof. Cozzi, at the Torretta spring, at the Baths of Viterbo, near Rome, the temperature of which is 137° Fahr.

Other mineral salts occur in thermal springs besides chlorides, carbonates, and sulphates, but only in traces; they are—fluorides, arseniates, borates, phosphates, iodides, bromides, and silicates, besides two organic salts of iron, the crenate and apocrenate. The occurrence of the first three of these salts is rather rare, or, more strictly speaking, they have not been sought for in every instance; the others are pretty generally diffused. Bechi, seems to think that fluoride of calcium is to be detected in most of the waters about Florence; and he has given a list of mineral springs in which he has ascertained its presence. Practically speaking, however, the therapeutic value of all these salts is restricted to the iodides, bromides, phosphates, and borates, where they are forthcoming in sufficient quantity.

It is worthy of notice that most of the springs in Italy contain, besides the gases we have alluded to above, and which are often of considerable volume, a certain quantity of nitrogen and oxygen, sometimes in the natural proportion in which they exist in the atmosphere, but oftener with a predominance of one or other of these elements. The hot air is sometimes utilized medicinally, and is esteemed in proportion as it is dry; such hot-air baths exist in the Island of Iscchia, at the entrance to the Gulf of Naples; the gaseous fluid issues from the crevasses of caverns in the volcanic rock. Only one natural hot-air bath is found in Central Italy, at Monsummana.

Mineral springs are, indeed, spotted over the surface of the kingdom, but they occur in groups in certain places. It is most usual to find them at a low level, and in general they occur in some narrow valley beside the bed of a torrent, possibly because the latter has been

found in the vicinity of some geological fault, through which the spring has forced its passage to the surface. It is very rare that thermal springs should be met with in Italy at any distance from the hills, although exceptions may be at once suggested in the very towns of Leghorn and Pontidera (*Pisa*), in the absence of any elevation of the slightest kind within miles round.

#### MONTECATINI, IN THE VAL DI NIEVOLE (FLORENCE.)

THE thermal waters of Montecatini deserve a prominent position in any description of the mineral springs of Central Italy; for, besides their well-authenticated and old-established therapeutical qualities, they possess excellent accommodation for bathers and drinkers, which, combined with a genial climate, and the ready access by railway, in two hours and a half from Leghorn, two from Pisa, and one and a half from Lucca and Florence, render this a most important spa.

Numerous authors of reputation have written memoirs on these springs, among whom may be mentioned Bicchierai, who published a work at Florence, in 1788, entitled *Dei Bagni di Montecatini, Trattato*, which, though superseded as far as the chemical part is concerned, is still important medically, and considered an excellent literary production, being quoted in the Dictionary of the Crusca Academy. That distinguished chemist, Dr. Antonio Targioni-Tozzetti, whose authority as analyst of the Tuscan mineral waters is held in high esteem, spent much of his time at Montecatini. Piria, a senator, and first of contemporary Italian chemists, whose death, during the past year, was a severe loss to the University of Turin, was one of the analysts who, in 1852, conjointly with Targioni and Taddei, examined these waters; and another rising chemist, Bechi, of Florence, has shown the presence of cesium and lithia in the spring of the Regina.

Montecatini possesses some fine buildings, in which the mineral waters are collected and employed for baths or drinking. Some of them date from the middle of the 18th century. There is likewise an hospital, to which a large number of patients are sent from all parts of the province, owing to the incontestable value of the waters in a large class of disorders; and if this place were better known abroad, there is no question but it might in a few years enjoy the same reputation as many of the spas of Germany, and be equally useful to suffering humanity. An important step has just been taken in the establishment of depôts for the sale of the Tettuccio water in the principal towns of the kingdom, so that now it may be procured at any large chemist's shop, and the commerce which is springing up in consequence,

unquestionably entitles it to be enumerated among the economic resources of the country.

Seven of the springs belong to the Government, those of *Bagno Regio*, *Terma Leopoldine*, *Tettuccio*, *Cipollo*, *Rinfresco*, *Olivo*, and *Regina*; these constitute the *Regie terme*, or Royal Baths of Montecatini, over which a medical man, Dr. Fedeli, is appointed to attend to the patients during the season.

All the other springs are private property, and their sale has been licensed by law, after their chemical constitution has been first ascertained by analyses.

The geological relations of the mineral springs of Montecatini have been studied by Savi, who comes to the following conclusions:—The groups of mountains in Central Italy, existing to the west of the Apennines, commencing at Spezia and continuing to the province of Rome, in the form of a succession of ellipses, whose axis takes a S.S.E. direction, thus differing from the Apennines themselves, which run E.S.E., have been called by him the *metalliferous chain*, from the circumstance of the numerous important mineral lodes they contain. These mountains are formed of rocks of all periods, palæozoic, secondary, and tertiary, whilst the Apennines are composed entirely of argillaceous limestones and schists, of the cretaceous period, and tertiary *macigno*, sandstone, clay, &c. Savi considered that at the time when the metalliferous chain was upheaved, and which his able and well-known researches proved to be after the great backbone of Italy was formed, the mineral springs of Montecatini, Pisa, Lucca, and others placed intermediately, originated in the crevices created by the upheaval in question, penetrating from the oldest palæozoic strata. Those springs at Montecatini which lie close to the foot of the hill, all issue directly from the cretaceous red argillaceous schists; others, further from the hill, in the direction of the plain, have pierced these strata, together with the superincumbent tertiary clays, as well as the travertine resulting from the deposits of the mineral springs themselves.

The whole group of waters at Montecatini are saline, and as they have a common geological origin, and issue from the strata of the same rock, they have, for the sake of comparison, been placed side by side in the table, ranging them according to the relative weight of aperient principles they contain in solution, in 1,000 parts of water, commencing with the most highly mineralized, and proceeding regularly in descending order down to the lowest, irrespective of their temperature, which ranges from 81° (Leopold baths) to 63° (Regina spring). They all contain chlorides of sodium and magnesium, carbonates of magnesia and lime, and sulphate of lime in the following proportions:—

NaCl, from 0·3 to 18·5 parts by weight in 1,000; MgCl. 0·15 to 1·6; MgO.CO<sub>2</sub>, 0·007 to 0·38; CaO.CO<sub>2</sub> 0·01 to 0·57; CaO.So<sup>3</sup> 0·01 to 2·2. The other medicinal constituents to be found in some of them are sulphates of soda and potash, not to mention phosphates and infinitesimal traces of alkaline iodides, bromides, and nitrates of no practical use. The water of the Leopold baths is too saline for internal use, containing, as it does, 2 per cent. of salts in solution. All the rest, except the Angelo and Cipollo springs, are employed internally.

It may be easily judged that from the preponderance of chlorides they are eminently purgative. The Leopold and Tamerig springs contain most sulphate of lime, which, though not absolutely injurious to the animal economy, is usually considered by medical men as at least passive, and therefore a useless weight, so much so that the value of mineral waters is reckoned by many medical men in inverse proportion to the quantity of this salt they contain.

*General Remarks on the Montecatini Waters, by Dr. Fedeli.*—They act by absorption into the system during baths no less than when taken internally. In the latter mode of using them they are most active in different forms of chronic diseases, and as their remedial effect depends upon the quantity drunk, while there is no danger of their producing burning thirst or colic, they are most useful in gastric and bilious complaints, as well as in dysentery and dysentery. Dr. Fedeli states that he employed them with the happiest results on persons coming from Egypt, with whom no other remedy had produced any effect. Taken internally, and as baths, they produce an important action on the digestive organs in cases of obstruction of the abdominal viscera, especially the liver and pancreas, reducing hyperemia and hypertrophy of these organs after a few days' use. They are also valuable in icterus, biliary calculi, gastralgia, and colic; they are useful in modifying scrofular diathesis and curing herpes. Some of them act usefully, both in baths and medicinally, for the cure of gravel and urinary calculi, &c.

Four springs have been walled in for several centuries, being mentioned as in existence in 1550, and subsequently enumerated by Bicchierai as known in his time (1788). These are the Leopold, Medicean, and Royal baths, and the Tettuccio. He states, with regard to the Regina, that the water had not, from time immemorial, risen above the level of the ground, but that on making the most superficial excavations an abundant supply was attainable. Giovanni Targioni-Tozzetti enumerates among the flora around the spring the following plants, which will be recognised by botanists as being species which flourish in the immediate vicinity of the sea-coast:—*Armaria rostra maritima*, *Plantago maritima*, *Potamogeton maritimum*, *Ruppia maritima*, *Salicornia fruticosa*, *S. herbacea*, *Tamarix gallica*, &c.

The *Papo* spring was conveyed away by the old Tuscan Government, in a covered channel, on account of the inhabitants having utilized it for the extraction of culinary salt for their

own consumption, and it now loses itself in the river.

*Leopold baths (Terme Leopoldine)*, anciently known as the *Bagno de marli*, or *della Roqua*, on the right bank of the Salsero torrent, at 300 yards from the Tettuccio spa.

Physical properties:—Sp. gr. greater than all the other springs, being 1·0185; temp. 81°; contains salts of iron, which, by absorbing oxygen, leave a deposit of sesqui-oxyde on the surface of the baths, which finally acquires a dark-brown colour; opalescent, in which it differs from the rest of the Montecatini waters; smell, that characteristic of chlorides; taste saline, and somewhat bitter.

*Bagno Regio*, formerly styled *Bagno dei Cavalli*, or the horse bath, 150 yards from the Leopold baths, on the opposite bank of the Salsero. It has formed vast masses of travertine, or thermal limestone, through which it finds its way to the surface. Phys. prop.:—Limpidity between that of the Tettuccio and Medicean baths; smell somewhat like saffron; taste sharp.

*Acqua della Regina*, on the site of the ancient *Bagno della Regina*, mentioned by Ugolino di Montecatini, *De Balnearum Italiae proprietatibus*, though not the same as the latter. It went to ruins, and was lost some time ago, on the left bank of the Salsero, half-way between the Tettuccio and the Bagno Regio.

Phys. prop.:—Limpid, and perfectly colourless; taste somewhat saline, less disagreeable than the Olivo.

Medicinal prop.:—Diuretic; mild laxative; so that it cannot produce the inconvenient effects which are sometimes the case with stronger waters.—*Fedeli*.

*NUOVA ACQUA DELL' OLIVO.*—This spring has been employed by Dr. Fedeli for several years, with persons whose digestion is too impaired to enable them to take large doses of liquid, and it is important as containing the greatest amount of carbonate and phosphate of iron of any in the neighbourhood, and more sulphate of soda than the Tettuccio and Rinfresco.

*Acqua del Tettuccio*, so called from a little roof, *tettuccio*, which was originally placed over it to protect the persons who came there to drink it. Mentioned by Ugolino di Montecatini as the new bath, *Bagno nuovo*, the Florentines having built accommodation for bathers at this spot in 1370, during his time. The present building was erected by order of the Grand Duke, Pietro Leopoldo, in 1779. That sovereign was likewise the founder—the builder—of the present Royal baths, in 1783, and the Leopoldine baths in 1775. It is close to the Salsero torrent, and has been held in the highest repute of all the waters of Montecatini for several centuries. It might aptly be styled the Queen of the saline waters of Central Italy.

**Phys. prop.** :—Diaphanitiy less than that of the Medicean bath; no smell; marked bitter saline taste.

**Med. prop.** :—Mild laxative; produces neither nausea nor parching of the lips. Its action chiefly exerts itself on the blood, and the entire assimilatory system; mineralization not so great as the waters hitherto described. Hypochondriasis and hysteria, connected with disorders of the gastro-hepatic organs, are modified in a remarkable manner by the use of this water. Drunk by persons who live in the miasmatic regions, along the coast of South of Leghorn, known as the *Maremma*, and who have been attacked by the baneful fevers which prevail there, the Tettuccio waters have a wonderful power in simplifying the nature of the disease, and rendering its action less pernicious. In its more ordinary employment for bilious and gastric complaints, dysentery and diarrhoea, the results obtained are very important.—*Fedeli*.

This water may be purchased in flasks at the principal chemists.

*Acqua del Cipollo*.—In the same building as the Tettuccio.

*Acqua del Rinfresco*, or *Bagno Mediceo*, anciently called the *Bagno tondo*, or the *Bagnolo*, close to the foot of the Monte delle Penteraie.

**Phys. prop.** :—Crystalline limpidity; no smell; taste very slightly saline acidulous; by no means unpalatable.

**Med. Prop.** :—Being but little mineralized it is suited for those on whom the stronger waters would produce too marked an effect. It restores the digestive functions, and being itself of easy digestion, and containing carbonic acid, is chiefly adapted for diseases of the urinary organs, especially gravel and calculi, of which it favours the expulsion.—*Fedeli*.

Proceeding now to notice the springs belonging to private individuals, which are probably as useful in their effects as the others, we have the *Acqua della Fortuna*, in a building situated N.E. of the Leopold baths, and near the Tamerigi spring, to which it is very analogous in chemical composition and medicinal properties. There is a convenient building for bathing and drinking.

**Phys. prop.** :—Limpid; without any smell; taste somewhat saline, and slightly bitter, though by no means unpleasant, even when drunk in large quantities; temperature differing but little from that of the atmosphere.

**Med. Prop.** :—Mild purgative; produces no derangement of the stomach. Excellent for removing bilious secretions and renovating the digestive organs, and restoring the appetite. Useful for enlargements of the liver, simple and calculous hepatalgia, icterus, hypochondriac affections, diarrhoea, and dysentery.—*Ant. Targ. Tozzetti*.

Sold in Florence, &c.

*Acqua della Torretta*.—Building between the Tettuccio and Bagno Mediceo, so called from a tower in the garden. There is a convenient bathing establishment at the spring, the director of which is a medical man. The water is sold at druggists' shops. **Phys. prop.** :—Trans-

parent; colourless; no odour; strong saline taste; contains a small quantity of gases, which are evolved on exposure to the atmospheric air.

**Med. prop.** :—Strong purgative and tonic, but not styptic. Useful in combating incipient scrofula, and for hyperæmia of the liver and bowels, &c. It is sometimes employed in soup, in cases where its bitter taste would be too distasteful.—*Dr. Giuntoli*.

*Acqua Tintorini*.—Close to the Martinelli spring. **Phys. prop.** :—Limpid; devoid of smell; taste saline, and somewhat bitter.

**Med. prop.** :—Purgative.

*Acqua dell' Angiolo*.—Close to the Tamerigi spring, going towards the Leopold baths. Discovered in 1859 by Angiolo Giuntini. **Phys. prop.** :—Limpid; transparent; without smell; decidedly saline, and somewhat bitter taste.

**Med. prop.** :—Purgative; same application as the Tamerigi water.

*Acqua delle Tamerigi*, so called from the Tamarisk trees which grow all around it. A little to the west of the Leopold baths.

**Phys. prop.** :—Transparent; colourless; no odour; saline taste, by no means disagreeable.

Sold in commerce.

**Med. prop.** :—Purgative.

*Acqua della Martinelli*.—Close to the thermal establishment of Montecatini, immediately at the foot of the mountain.

**Phys. prop.** :—Limpid, and transparent; no smell; saline, but not unpleasant, taste; evolves little bubbles of atmospheric air and carbonic acid, and leaves no deposit. It does not undergo any change by being conveyed away from the spring, and is, consequently, sold in the towns.

**Med. prop.** :—Purgative; cooling.

*Acqua della Salute*.—Close to the Leopoldine baths. Issues from argillaceous schists, covered with travertine deposited by springs in the vicinity. **Phys. prop.** :—Limpid; colourless; without smell; slightly saline taste and bitter, though this last property is only appreciable to those whose palate is very delicate.

*Acqua della Speranza*.

**Phys. prop.** :—Limpid; transparent; smell agreeable, and somewhat saline taste; has a considerable refrangent power, and possesses a great degree of electric conductivity.

**Med. prop.** :—Purgative.

*Acqua del Killino*.—Discovered in 1847, near the Torretta spring. **Phys. prop.** :—Very limpid; no smell; saline, but not unpleasant, taste.

*Thermo-mineral spring of Monsummano*.—At a short distance from Montecatini is the town of Monsummano, situated on a hill, at the foot of which is seen the thermal spring where the proprietor is building an extensive bathing establishment.

**Phys. prop.:**—Very limpid; colourless; taste slightly saline, discernible by careful examination; in contact with the air leaves a soluble white precipitate; temperature  $88^{\circ}$ , constant during all seasons. The water gives off vapour, which is very visible in Winter, and even in Summer, provided there are no currents of air. This vapour is similar in composition and in nature to that of the cavern of Monsummano.

**Med. prop.:**—Has been employed with success in baths, according to the statement of various medical men, for incipient rheumatism.

**Grotto of Monsummano.**—Discovered in 1849, at the south side of the mountain, in the limestone rock. During the last few years it has acquired importance from its vapour being employed for medicinal baths. The entrance is by steps leading down to a vestibule, the temperature of which is  $27\frac{1}{2}^{\circ}$  C; from hence a second chamber is reached; and, lastly, the principal part of the grotto, where the thermometer stands at  $31\frac{1}{4}^{\circ}$  C. This cavern contains several pieces of water of an elevated temperature, that farthest from the entrance standing at  $35^{\circ}$  C. It is near this place that persons remain in order to obtain the beneficial effects of the vapour arising from the pools of water. The thermometric variations in the grotto during the course of the year are very slight, and the air is always moist. An examination of the chemical composition of these gases, by Professor Antonio Targioni-Tozzetti, furnished in 1,000 parts, by volume, and at the temperature and pressure existing in the grotto itself:—

Carbonic acid,	-	-	36.5
Atmospheric air,	-	-	955.4
Excess of nitrogen,	-	-	8.1

1000.0

**Med. prop.:**—Targioni describes the sensation of this vapour as at first rather oppressive, but soon becoming more agreeable, from the facility with which respiration goes on, so that it tends to raise the spirits, and render the person gay and cheerful. The vapour baths have been found beneficial for gout, affections of the joints, and all rheumatic diseases; for impaired digestion; for diseases of the skin; and some nervous disorders, including paralysis, &c.—*Prof. Targioni-Tozzetti; Dr. Vissarelli.*

These are the only natural vapour baths in Tuscany. In the South, those of Ischia, near Naples, are well known and much frequented, and produce somewhat analogous effects. There is a bathing establishment at the grotto. The season lasts from the beginning of June to the end of September.

**Acqua minerali di Quarrata**, about a mile from Montecatini, and one from Pescia.

**Phys. prop.:**—Limpid; inodorous; taste cool, and rather salt and bitter.

**Med. prop.:**—Purgative; antiscrofulous; useful in chronic impregnations of the liver and pancreas.—*Cuticini.*

#### PORRETTA.

Few regions of Italy are less known to foreigners than the Apennines, that range of mountains which, down to the days of Stephenson, according to Dante's description of them, not only divided the country into two parts, in a political and social sense, but were themselves almost unexplored. Fortunately, the progress of civilization and liberty has tended to destroy this barrier. The electric fluid unceasingly passes through the wires which wind up the rugged slopes of these mountains, and cross them in every direction, linking together cities so effectually separated up to our times that it was a common occurrence for the traveller, especially in the south, to make his will previous to incurring the risk of performing the journey. Railways, too, have wended their way up the banks of the impetuous torrent, and pierced the mountain sides in several places. One of them, the line between the Emilia and Florence, follows the course of the Reno from Bologna to Pracchia, and just before ascending the steep gradients near the entrance to the principal tunnel, at a height of 640 feet above the sea-level, passes the interesting locality we are about to describe. The baths of Porretta are most conveniently situated within a few minutes' walk of the new railway station, and accessible in a few hours from Turin, Florence, and Milan, the bathing season lasting from the beginning of June to the end of August.

These baths have enjoyed a high reputation for centuries, though, from the absence of all inducement in the way of necessary comforts, and the grievance of passports, they were only employed locally by the neighbouring populations. The people are accustomed to use a proverb, showing the great and varied benefits derived from these waters:—"La Porretta o ti sana o ti netta" (the Porretta will cleanse you if it does not cure you). We read accounts of Porretta in the medical papers on mineral waters published by the Venetian Junta in 1553, under the title of *De Balneis omnia quæ extant*, &c.; and we are informed that already, in 1368, the Senate of Bologna gave certain privileges to persons building suitable accommodation for bathers (*Bassi, Della Terme Porrettane*). Various authors have written upon these waters, the most remarkable works, besides the one we have just mentioned, which was published anonymously at Rome in the year 1768, are those of Sgarzi, Dr. Maunoir (*La Porretta et Montecatini*, in French), and Paolini. It will be interesting to advert, in passing, to the circumstance of Galvani having been engaged in chemical and physical researches at the Porretta spring, which were never completed on account of his death. Comparing the present condition of these springs with the observations recorded by Bassi a century ago, it is clear that they can have undergone little change since then. They

would still offer a large field for enquiry to the geologist or chemist who might be induced to investigate more fully their peculiar characters, and their relation to volcanic agencies, for Porretta would appear to be situated in the vicinity of certain subterranean movements, and so late as within the last two years an earthquake caused considerable damage to the buildings of the adjoining little town of Vergato.

Several springs are employed, and have been enclosed in convenient buildings; they are known by the following names:—*Bovi, Tromba, Marte, Reale, Donzelle, Leone, Puzzola*, and *Porretta Vecchia*. Their temperature, invariable all the year round, ranges from  $58^{\circ}$  to  $70^{\circ}$ . Their mineral constituents range from  $7\frac{1}{2}$  to 9 parts in 1,000, by weight, principally chloride of sodium, amounting to from  $6\frac{1}{2}$  to  $8\frac{1}{2}$  per 1,000, besides a small proportion of alumina, and carbonate of soda and lime, associated in the *Puzzola* with bromides. The gases present, in solution, in these waters are no less uniform in their character, and present special interest; the carbonic acid and sulphuretted hydrogen being accompanied by carburetted hydrogen in surprising quantities, varying in volume from 4 in 1,000 parts in the spring of *Porretta Vecchia*, to 57 in the *Bovi*, proving to what great pressure the waters must be subjected previous to reaching the surface.

The *Porretta* waters may be taken as typical of the rare sub-class of springs containing carburetted hydrogen. It is probable that all those of this category in Italy are limited to the provinces of Bologna, and a little portion of that of Florence lying east of the Apennines.\*

The volume of carbonic acid is nearly constant in all the springs, while the amount of carburetted hydrogen may be described as in inverse proportion to that of the sulphuretted hydrogen. Such a large quantity of inflammable elastic fluid perpetually emanating under pressure from narrow fissures in the rock, it may easily be imagined how the bubbles of gas, liberated from the surface of the waters, should burn when a light is brought in contact with them, as was already noticed by Bassi, who adds, further, that at *Marte* and *Reale* the flame soon goes out, while at *Leone* and *Bovi* it lasts indefinitely, rising in this last to a height of two feet, justly entitling them to be called burning fountains. Nor do the thermal springs alone furnish gaseous emanations. *Maunoir* describes the *Sasso Cardo* as abounding with fissures, from which issue moto-carburetted hydrogen, which burns on the application of a light; and, after some time, when the flame penetrates into the rock, leads to the explosion of the gases in some subterranean cavern, the

\* The springs which suggest themselves as most nearly resembling the *Porretta*, in other parts of the world, are those in the State of New York, of which Dr. Lee has given an account, accompanied by analyses.

existence of which is further proved by the hollow sound of the ground when struck. The temperature of the fissures is constantly from  $95^{\circ}$  to  $97^{\circ}$  (*Maunoir, La Porretta et Montecatini*, p. 15).

Among the physical properties of the *Porretta* waters mentioned by *Maunoir*, is the difficulty with which they freeze, even when exposed to a considerable degree of artificial cold, especially those rich in carburetted hydrogen, and their soft unctuous feel. A person who has taken a bath in one of them comes out, after a certain time, covered with oily-looking globules, which repel the contact of water with the skin. In the year 1834, an artisan at *Porretta* proposed to utilize the gases arising in such abundance from the springs of the *Bovi*, for the purpose of lighting up the building, and a gas lamp was placed over the door. Since then part of the little town has been lit with the natural gas, though no system of purification has been employed. On the bottom of the baths these waters leave a peculiar gelatinous deposit, partaking of an organic nature, and well known to medical men from its great therapeutic virtues. The waters of *Porretta Vecchia*, *Puzzola*, and *Donzelle*, smell of sulphuretted hydrogen, and have a somewhat offensive saline taste.

The waters of *Porretta* are, generally speaking, purgative, diuretic, and slightly stimulating. The sulphur and bituminous matters they contain impart to them healing properties. As a general rule they are strongly mineralized, and should not be taken without due caution, and the advice of a medical man, of whom, however, there is a most able one in the establishment during the season, Dr. Paolini, of Bologna.—*Maunoir, Paolini*.

**PORRETTA VECCHIA**—sometimes called *Acqua della Madonna*, from a chapel near it—issues from macigno sandstone and cretaceous alberese limestone rock in *Monte Procchetta*.

Phys. prop.:—Limpid; transparent; definite smell of sulphuretted hydrogen; slightly disagreeable saline taste.

Med. prop.:—Employed externally and medicinally in cutaneous, rheumatic, and arthritic affections; paralysis, *fisconia*, glandular indurations; in certain convulsive diseases; asthma; some intestinal and uterine disorders; as well as to remedy the consequences of irregularity in the function of the excretory organs.—*Maunoir, Paolini*.

**ACQUA DEL LEONE** formerly called *Porretta nuova*, issues from the slopes of *Monte Sasso Cardo*, on the left bank of the *Rio Maggiore*, between the sandstone and slaty schist. It is the principal of the *Porretta* waters, and has acquired ever increasing importance within the last one hundred years, before which time it had been a long while neglected, as has been argued from the masses of ruins discovered on the spot.

Phys. prop.:—Limpid; transparent; smells of sulphuretted hydrogen; taste saline, somewhat bitter, and not agreeable—compared by *Maunoir* to that of watery broth.

Med. prop.:—Analogous, in a medicinal point of view, to the celebrated *Tettuccio* and *Torretta* waters, at

**Montecatini.** Sold in flasks in the shops at Bologna. Employed for diseases of the abdominal viscera; engorgements of the uterus; in lymphatic and glandular disorders. It is likewise advantageous in paralysis, congestion, and other diseases.—*Maunoir ; Paolini.*

**DONZELLE.**—Formerly there were three sculptured female heads, from the mouths of which the water flowed, whence the name it then bore of *fonte delle tre bocche*, or spring of the three mouths. Issues from the strata of eocene sandstone on the right bank of the Reno, at the foot of the Monte della Croce. Provided with a small building for bathers and for drinking.

**Phys. prop.** :—Limpid ; transparent ; sensible smell of sulphuretted hydrogen ; taste somewhat bitterish and disagreeable.

**Med. prop.** :—Less purgative than the Leone. Externally it is useful, from the quantity of sulphuretted hydrogen it contains, in the cure of rheumatic, arthritic, hemorrhoidal, and vascular disorders.—*Maunoir ; Paolini.*

**PUZZOLA**, from *puzzo*, disagreeable odour, issues out of the hill, at a distance of 100 paces from the Porretta Vecchia, in the direction of the town. **Phys. prop.** :—Colourless ; transparent ; smells of sulphuretted hydrogen ; taste saline, sulphureous.

**Med. prop.** :—Composition analogous to that of the Porretta Vecchia ; uses very similar. When employed for baths it is generally heated artificially. Specially useful in certain morbid conditions of the skin, stomach, and uropoietic system. Very important in cases of giddiness produced by gastroenteric lesions, and employed with advantage in cutaneous disorders and arthritic affections. This water deposits a large quantity of bronze-green slime or glairine, the smell of which is empyreumatic, combined with that of sulphuretted hydrogen. It is employed externally for diseases of the skin, and affections of the joints.—*Maunoir ; Paolini.*

**BOVI** originates on the left bank of the Rio-maggiore, in the Sasso Cardo mountain. Placed in the same building as the Leone.

**Med. prop.** :—Used solely for bathing and douches, on account of the preponderance of sulphuretted and light carburetted hydrogen. It has great analogy to sea-water. Advantageous in scrofular disorders, indurations, engorgements, *leprosis*, paralysis, &c.—*Maunoir ; Paolini.*

**MARTE** rises at the foot of the Monte della Croce, on the right side of the Rio-Maggiore. Placed together with the Tromba and Reale in the same building, situated close to the Donzelle spring. **Phys. prop.** :—Colourless ; transparent ; with a scarcely perceptible smell of sulphuretted hydrogen ; saline disagreeable sulphureous taste.

**Med. prop.** :—Employed for baths and douches. As it is irritating to the digestive organs, and acts as an emetic, it cannot be administered internally. The temperature is high, increasing its energy of action, and rendering it useful in paralysis, chronic affections of the glands, muscles, and bones, and certain forms of necrosis.—*Maunoir ; Paolini.*

**REALE** rises at the foot of the Monte della Croce, close to the Marte, with which Gambellini considers it to have a common origin.

**Phys. and Med. prop.** :—Same as the Marte. Used solely for baths.—*Maunoir ; Paolini.*

**TROMBA**, close to the Marte and Reale, at the base of Monte della Croce, on the right bank of the Rio-Maggiore torrent. Supplies the baths of Diana and Minerva.

**Med. prop.** :—Same applications as the Bovi and Marte.—*Maunoir ; Paolini.*



CENTRAL ITALY.				LUCCA							
SALINE SPRINGS.				MONTE CATINI IN							
West of the Apennines.				Terme Leopoldine	Acqua della Fortuna	Acqua della Torretta	Acqua Tintorini	Bagno Regio	Angelo	Tamerici	
a B, Baths; D, Douches; I, Internal.				Targioni-Tozzetti, Taddai, Piria 1852	Targioni-Tozzetti 1852	Buonamici 1861	Casanti 1851	Targioni-Tozzetti, Taddai, Piria 1852		Targioni-Tozzetti, Buonamici 1852	
Analyst,											
Date of Analysis, -											
USE OF THE SPRING a				B D	I	I	I	I	D B	I	
TEMPERATURE				Centigrade	nearly of	21°	nearly of	24°3			
				Fahrenheit	atmos.	70°	atmos.	76			
SPECIFIC GRAVITY				1.0185	1.010	1.0082	1.0118	1.0114		1.0027	
HALOID SALTS.	CHLORIDE OF	Sodium	Na Cl	18.5455	10.9733	11.7992	11.7607	9.3072	11.0547	10.9114	
		Potassium	K Cl	—	—	—	—	—	—	—	
		Ammonium	NH <sup>+</sup> Cl	—	—	—	—	—	—	—	
		Magnesium	Mg Cl	0.7328	1.631	0.6275	0.4615	0.9564	0.1230	0.1322	
		Calcium	Ca Cl	—	—	—	—	—	—	0.1067	
	IODIDE OF	Iron	Fe Cl	—	—	—	—	—	—	—	
		Sodium	Na I	•	•	•	•	•	•	•	
		Potassium	K I	—	—	—	—	—	—	—	
	BROMIDE OF	Magnesium	Mg I	—	—	—	—	—	—	—	
		Base not specified	R I	—	—	—	—	—	—	—	
OXYDES.	FLUORIDE OF	Sodium	Na Br	•	•	•	•	•	•	•	
		Potassium	K Br	—	—	—	—	—	—	—	
		Magnesium	Mg Br	—	—	—	—	—	—	—	
	SULPHIDE OF	Base not specified	R Br	—	—	—	—	—	—	—	
		Calcium	Ca S	—	—	—	—	—	—	—	
		Sodium	Na S	—	—	—	—	—	—	—	
	OXYDE OF	Calcium	Ca S	—	—	—	—	—	—	—	
		Base not specified	R S	—	—	—	—	—	—	—	
		Manganese	Mn O	—	•	—	—	—	—	—	
	SESQUIOXIDE OF	Iron	Fe O	—	•	with Fe <sup>2</sup> O <sup>3</sup>	—	—	—	—	
Aluminium (Alumina)		Al <sub>2</sub> O <sub>3</sub>	—	0.0188	Fe <sup>2</sup> O <sup>3</sup>	•	•	0.0071	0.0052		
Silicium (Silica)		Si O <sub>2</sub>	—	0.0101	0.0052	0.0072	—	—	—		
Iron		Fe <sup>2</sup> O <sup>3</sup>	•	•	0.0009	—	—	—	—		
NITRATE OF	Soda	NaO. NO <sup>3</sup>	RO. NO <sup>3</sup>	RO. NO <sup>3</sup>	—	—	—	RO. NO <sup>3</sup>	—		
	Potash	KO. NO <sup>3</sup>	0.0831	0.8089	0.4482	0.1690	1.3286	0.3834	—		
	Soda	NaO. SO <sup>3</sup>	0.3719	0.2765	0.0989	0.2170	0.1597	0.1374	—		
OXYSALTS.	SULPHATE OF	Potash	KO. SO <sup>3</sup>	—	—	—	—	—	—	—	
		Ammonia	NH <sup>4</sup> O. SO <sup>3</sup>	—	—	—	—	—	—	—	
		Magnesia	MgO. SO <sup>3</sup>	—	0.5142	—	—	—	—	0.3724	
	PHOSPHATE OF	Lime	CaO. SO <sup>3</sup>	2.1996	0.0138	0.6237	1.9372	0.3453	1.0000	1.0254	
		CARBONATE OF	Iron	FeO. SO <sup>3</sup>	—	—	—	—	—	—	—
			Iron (Sesquisalt)	Fe <sup>2</sup> O <sup>3</sup> . 3SO <sup>3</sup>	—	—	—	—	—	—	—
	Alumina		Al <sup>2</sup> O <sup>3</sup> . 3SO <sup>3</sup>	—	—	—	—	—	—	—	
	BICARBONATE OF	Alumina	Al <sup>2</sup> O <sup>3</sup> . 3PO <sup>3</sup>	0.0196	—	with Fe <sup>2</sup> O <sup>3</sup>	—	0.0145	—	—	
		Lime	CaO. 2PO <sup>3</sup>	+	•	—	—	+	—	—	
		Base not specified	RO. PO <sup>3</sup>	—	—	—	—	—	—	—	
BIBORATE OF	Soda	NaO. CO <sup>2</sup>	—	—	—	—	—	—	—		
	Potash	KO. CO <sup>2</sup>	—	—	—	—	—	—	—		
	Lithia	LiO. CO <sup>2</sup>	—	—	—	—	—	—	—		
GASES.	By Volume.	Magnesia	MgO. CO <sup>2</sup>	0.0071	0.7115	0.087	—	0.3822	—	0.130	
		Lime	CaO. CO <sup>2</sup>	0.5639	0.1438	0.4862	—	0.2242	—	0.05	
		Iron	FeO. CO <sup>2</sup>	—	—	—	—	—	—	—	
	By Weight.	Manganese	MnO. CO <sup>2</sup>	—	—	—	—	—	—	—	
		Sesquicarbonate of Alumina	Al <sup>2</sup> O <sup>3</sup> . 3CO <sup>2</sup>	—	—	—	—	—	—	—	
		Bicarbonate of Soda	NaO. 2CO <sup>2</sup>	—	—	—	—	—	—	—	
	By Volume.	Potash	KO. 2CO <sup>2</sup>	—	—	—	—	—	—	—	
		Lithia	LiO. 2CO <sup>2</sup>	—	—	—	—	—	—	—	
		Magnesia	MgO. 2CO <sup>2</sup>	—	—	—	0.0376	—	—	—	
	By Weight.	Lime	CaO. 2CO <sup>2</sup>	—	—	—	0.3574	—	0.4340	—	
Iron		FeO. 2CO <sup>2</sup>	—	—	—	—	—	—	—		
Manganese		MnO. 2CO <sup>2</sup>	—	—	—	—	—	—	—		
PURE WATER in 1,000 parts by weight	Ammonia	NH <sup>4</sup> O. 2BO <sup>3</sup>	—	—	—	—	—	—	—		
	Soda	NaO. 2BO <sup>3</sup>	—	—	—	—	—	—	—		
	Organic Matter	3FeO. C <sub>24</sub> H <sub>12</sub>	—	—	—	—	—	—	—		
NITROGENOUS ORGANIC MATTER	Loss	2FeO. C <sub>48</sub> H <sub>12</sub>	—	—	—	—	—	—	—		
	Loss	—	—	—	—	—	—	—	—		
	Loss	—	—	—	—	—	—	—	—		
By Volume.	By Weight.	TOTAL MINERAL & ORGANIC MATTERS	—	22.5235	13.7240	14.2085	14.9648	12.7181	13.3681	—	
		Sulphuretted Hydrogen	HS	—	—	—	—	—	—	—	
		Carburetted Hydrogen	CH <sup>4</sup>	—	—	—	—	—	—	—	
	By Volume.	Carbonic Acid	CO <sup>2</sup>	0.5295	—	0.304	0.0057	0.2559	0.1866	—	
		Atmospheric Air	—	—	—	—	—	—	—	—	
		Nitrogen	N	0.1734	—	0.104	0.0115	0.1734	0.0013	—	
	By Weight.	Oxygen	O	0.0133	—	0.065	—	0.0216	0.0002	—	
		Sulphuretted Hydrogen	HS	—	—	—	—	—	—	—	
		Carburetted Hydrogen	CH <sup>4</sup>	—	—	—	—	—	—	—	
	By Volume.	Carbonic Acid	CO <sup>2</sup>	—	—	—	—	—	—	—	
		Atmospheric Air	—	—	—	—	—	—	—	—	
		Nitrogen	N	—	—	—	—	—	—	—	
By Weight.	Oxygen	O	—	—	—	—	—	—	—		
	PURE WATER in 1,000 parts by weight	HO	976.760	986.7260	985.2250	985.351	986.831	986.611	986.611		
	Weight of Aperient Principles	—	19.7404	13.5375	13.1824	12.6458	12.1341	11.6955	11.6955		

## THE VAL DI NIEVOLE

 $+ \text{P}_2\text{O}_5 + \text{H}_2\text{O}$

CENTRAL ITALY.					BOLOGNA.						
SULPHUREOUS CARBURETTED SPRINGS					1	2	3	4	5	6	
East of the Apennines—(cols. 1 to 11).					Acqua dei Bovi	Acqua della Tromba (two springs)	Acqua di Marte	Acqua reale	Acqua della Donzelle	Acqua de Leone	
SULPHUREOUS BORACIFEROUS SPRINGS					Sgarzi	Sgarzi	Sgarzi	Sgarzi	Sgarzi	Sgarzi	
West of the Apennines—(cols. 12 to 19).					1837	1837	1837	1837	1837	1837	
a B, Baths; D, Douches; M, Medicinal.											
Analyst, - - -											
Date of Analysis, - -											
USE OF THE SPRING a					B D	B	B D	B	B D M	B M	
TEMPERATURE Centigrade - - -					38°·9	35 to 36°	39°	37°·5	33°	36°	
Fahrenheit - - -					—	95 to 97°	—	100°	—	96°	
SPECIFIC GRAVITY - - -					—	—	—	—	—	—	
HALOID SALTS.	CHLORIDE OF Hydrogen (Hydrochloric Acid)				H Cl	7·5138	6·5555	6·5277	6·5555	6·9166	8·3472
	Sodium				Na Cl	—	—	—	—	—	—
	Potassium				K Cl	—	—	—	—	—	—
	Ammonium				NH <sup>+</sup> Cl	—	—	—	—	—	—
	Magnesium				Mg Cl	—	—	—	—	—	—
	Calcium				Ca Cl	—	—	—	—	—	—
	Iron				Fe Cl	—	—	—	—	—	—
	Sodium				Na I	·	·	·	·	0·0416	0·0972
	Potassium				K I	—	—	—	—	—	—
	Magnesium				Mg I	—	—	—	—	—	—
HALOID SALTS.	Base not specified				R I	—	—	—	—	—	—
	Sodium				Na Br	—	—	—	—	—	—
	Potassium				K Br	—	—	—	—	—	—
	Magnesium				Mg Br	—	—	—	—	—	—
	Base not specified				R Br	—	—	—	·	·	·
	Calcium				Ca F	—	—	—	—	—	—
	Sodium				Na S	—	—	—	—	—	—
	Calcium				Ca S	—	—	—	—	—	—
	Base not specified				R S	—	—	—	—	—	—
	Manganese				Mn O	—	—	—	—	—	—
OXYDES.	Iron				Fe O	—	—	—	—	—	—
	Aluminium (Alumina)				Al <sub>2</sub> O <sub>3</sub>	0·0416	0·0277	0·0277	0·0277	0·0684	0·0416
	Silicium (Silica)				Si O <sub>2</sub>	·	·	—	—	0·0694	—
	Boron (Boric Acid)				BO <sub>2</sub>	—	—	—	—	—	—
	Iron				Fe <sup>2</sup> O <sup>3</sup>	—	—	—	—	—	—
	Soda				NaO. NO <sup>5</sup>	—	—	—	—	—	—
	Potash				KO. NO <sup>5</sup>	—	—	—	—	—	—
	Base not specified				RO. NO <sup>5</sup>	—	—	—	—	—	—
	Soda				NaO. SO <sup>3</sup>	—	—	—	—	—	—
	Potassa				KO. SO <sup>3</sup>	—	—	—	—	—	—
OXYSALTS.	Ammonia				NH <sup>4</sup> O. SO <sup>3</sup>	—	—	—	—	—	—
	Magnesia				MgO. SO <sup>3</sup>	—	—	—	—	—	—
	Lime				CaO. SO <sup>3</sup>	—	—	—	—	—	—
	Iron				FeO. SO <sup>3</sup>	—	—	—	—	—	—
	Iron (Sesquisalt)				Fe <sup>2</sup> O <sup>3</sup> . 3SO <sup>3</sup>	—	—	—	—	—	—
	Alumina				Al <sup>2</sup> O <sup>3</sup> . 3SO <sup>3</sup>	—	—	—	—	—	—
	Alumina				Al <sup>2</sup> O <sup>3</sup> . 3PO <sup>5</sup>	—	—	—	—	—	—
	Lime				2CaO. PO <sup>5</sup>	—	—	—	—	—	—
	Base not specified				RO. PO <sup>5</sup>	—	—	—	—	—	—
	Soda				NaO. CO <sup>2</sup>	0·5853	0·3601	0·9027	0·5277	0·3513	0·2561
OXYSALTS.	Potassa				KO. CO <sup>2</sup>	—	—	—	—	—	—
	Lithia				LiO. CO <sup>2</sup>	—	—	—	—	—	—
	Magnesia				MgO. CO <sup>2</sup>	—	—	—	—	—	0·0833
	Lime				CaO. CO <sup>2</sup>	0·0853	0·1250	0·1388	0·2500	0·1249	0·0416
	Strontia				SrO. CO <sup>2</sup>	—	—	—	—	—	—
	Iron				FeO. CO <sup>2</sup>	—	—	0·0277	—	·	—
	Manganese				MnO. CO <sup>2</sup>	—	—	—	—	—	—
	Sesquicarbonate of Alumina				Al <sup>2</sup> O <sup>3</sup> . 3CO <sup>2</sup>	—	—	—	—	—	—
	Bicarbonate of Soda				NaO <sup>2</sup> . CO <sup>2</sup>	—	—	—	—	—	—
	Potassa				KO. 2CO <sup>2</sup>	—	—	—	—	—	—
OXYSALTS.	Lithia				LiO. 2CO <sup>2</sup>	—	—	—	—	—	—
	Magnesia				MgO. 2CO <sup>2</sup>	—	—	—	—	—	—
	Lime				CaO. 2CO <sup>2</sup>	—	—	—	—	—	—
	Iron				FeO. 2CO <sup>2</sup>	—	—	—	—	—	—
	Manganese				MnO. 2CO <sup>2</sup>	—	—	—	—	—	—
	Bisborate of Soda				NaO. 2BO <sup>3</sup>	—	—	—	—	—	—
	Arsenate of Base not specified				RO. AsO <sup>5</sup>	—	—	—	—	—	—
	CRENATE AND APOCRENATE OF Iron				3FeO. C <sup>24</sup> H <sup>12</sup> O <sup>16</sup> 2FeO. C <sup>24</sup> H <sup>12</sup> O <sup>16</sup>	—	—	—	—	—	—
	O. ORGANIC, & P. PSEUDO-ORGANIC MATTER				—	0·0555P	0·0555P	0·0445P	0·0227P	0·0833P	0·0000
	NITROGENOUS ORGANIC MATTER - - -				—	—	—	—	—	—	—
Loss - - -				—	0·0679	0·0557	0·0961	0·0419	0·0879	0·0000	
GASES.	TOTAL WEIGHT OF SOLID MATTERS - - -				—	8·3472	7·1805	7·7652	7·4305	7·6666	9·1000
	Sulphuretted Hydrogen				HS	—	—	—	—	—	—
	Carburetted Hydrogen				CH <sup>4</sup>	—	—	—	—	—	—
	Carbonic Acid				CO <sup>2</sup>	—	—	—	—	—	—
	Atmospheric Air				—	—	—	—	—	—	—
	Nitrogen				N	—	—	—	—	—	—
	Oxygen				O	—	—	—	—	—	—
	Sulphuretted Hydrogen				HS	1·964	12·767	12·767	14·732	22·588	16·000
	Carburetted Hydrogen				CH <sup>4</sup>	56·962	24·553	23·570	22·588	12·767	12·000
	Carbonic Acid				CO <sup>2</sup>	8·839	10·803	7·857	10·803	7·856	8·000
GASES.	Atmospheric Air				—	—	—	—	—	—	—
	Nitrogen				N	—	—	—	—	—	—
	Oxygen				O	—	—	—	—	—	—
	PURE WATER, in 1,000 parts by weight				HO	991·6528	992·8195	992·2348	992·5695	992·3334	991·0000
	Weight of Borates				—	—	—	—	—	—	—

‡ The Gases, analysed by Commaille and Lambert, 1860, in a litre

SALINE SPRINGS.				LEGHORN			PISA			
West of the Apennines.				Acqua della Salute, near at la Pigna, near Leghorn	Acqua Salina del Bagno di S. Rocco, Leghorn	Acqua di Collinaja, near Leghorn	Acqua di S. Felice, near Volterra	Val di Cecina	Acqua Salina purgativa di Gello, near Pontedera	Acqua di S. Vincenzio, Pontedera
Analyst				Garelli and Orsini 1855	Targioni-Torzetti 1837	Cozzi and Begni 1850	Cozzi 1858	Calamai 1847	Cozzi 1853	Targioni-Torzetti
Date of Analysis										
USE OF THE SPRING				M	B M	M	M	M	M	M
TEMPERATURE		Centigrade	Fahrenheit	16°	12°5	19° to 21°	12°4	12°5	15°	—
SPECIFIC GRAVITY		—	—	81°	54½°	66° to 70°	54½°	54½°	59°	—
				1·0118	1·0042	1·0056	—	1·0133	1·0064	1·0054
HALOID SALTS.	CHLORIDE OF	Sodium	Na Cl	14·1489	8·9448	10·829	6·346	0·2752	2·854	2·044
		Potassium	K Cl	—	—	—	—	—	—	—
		Ammonium	NH <sup>4</sup> Cl	—	—	—	—	—	—	—
		Magnesium	Mg Cl	2·8891	0·6587	2·599	1·935	3·1611	1·464	—
		Calcium	Ca Cl	1·1126	0·7446	—	1·518	—	—	—
		Iron	Fe Cl	—	—	—	—	—	—	—
	IODIDE OF	Sodium	Na I	0·0872	—	—	—	—	—	—
		Potassium	K I	—	—	—	—	—	—	—
		Magnesium	Mg I	—	—	—	—	—	—	—
		Base not specified	R I	—	—	—	—	—	—	—
HALOID SALTS.	BROMIDE OF	Sodium	Na Br	—	—	—	—	—	—	—
		Potassium	K Br	—	—	—	—	—	—	—
		Magnesium	Mg Br	—	—	—	—	—	—	—
		Base not specified	R Br	—	—	—	—	—	—	—
OXYDES	FLUORIDE OF	Calcium	Ca F	—	—	—	—	—	—	—
	SULPHIDE OF	Sodium	Na S	—	—	—	—	—	—	—
		Calcium	Ca S	—	—	—	—	—	—	—
		Base not specified	R S	—	0·0965	—	—	—	—	—
	OXYDE OF	Manganese	Mn O	—	—	—	—	—	—	—
		Iron	Fe O	—	—	—	—	—	—	—
		Aluminium (Alumina)	Al <sup>2</sup> O <sup>3</sup>	0·0088	—	—	—	Fe <sup>2</sup> O <sup>3</sup>	—	—
		Silicium (Silica)	Si O <sup>2</sup>	0·0122	—	—	0·043	0·0434	0·023	0·4000
	SESQUIOXYDE OF	Iron	Fe <sup>3</sup> O <sup>3</sup>	—	—	—	—	0·0542	—	—
	NITRATE OF	Soda	Na O NO <sup>3</sup>	—	—	—	—	—	—	—
OXYSALTS.		Potash	KO NO <sup>3</sup>	—	—	—	—	—	RO NO <sup>3</sup>	—
	SULPHATE OF	Soda	Na O SO <sup>3</sup>	0·2977	0·8468	3·303	0·164	5·7962	1·111	0·4162
		Potash	KO SO <sup>3</sup>	—	—	—	—	—	—	—
		Ammonia	NH <sup>4</sup> O SO <sup>3</sup>	—	—	—	—	—	—	—
		Magnesia	Mg O SO <sup>3</sup>	0·1127	0·5064	1·577	1·308	4·9357	1·399	1·0188
		Lime	Ca O SO <sup>3</sup>	0·5787	0·6722	0·655	1·026	0·8506	0·986	0·0420
		Iron	Fe O SO <sup>3</sup>	—	—	—	—	—	—	—
		Iron (Sesquisalt)	Fe <sup>3</sup> O <sup>3</sup> 3SO <sup>3</sup>	—	—	—	—	—	—	—
		Alumina	Al <sup>2</sup> O <sup>3</sup> 3SO <sup>3</sup>	—	—	0·013	—	—	0·044	—
		Alumina	Al <sup>2</sup> O <sup>3</sup> 3PO <sup>3</sup>	—	—	—	—	—	—	—
OXYSALTS.	PHOSPHATE OF	Lime	Ca O 2PO <sup>3</sup>	—	—	—	—	—	—	—
		Base not specified	RO PO <sup>3</sup>	—	—	—	—	—	—	—
	SILICATE OF	Alumina	Al <sup>2</sup> O <sup>3</sup> 3SiO <sup>3</sup>	—	—	—	—	—	—	—
	CARBONATE OF	Soda	Na O CO <sup>3</sup>	—	—	—	—	—	—	—
		Potash	KO CO <sup>3</sup>	—	—	—	—	—	—	—
		Lithia	Li O CO <sup>3</sup>	—	—	—	—	—	—	—
		Magnesia	Mg O CO <sup>3</sup>	0·0186	—	0·289	—	—	—	0·244
		Lime	Ca O CO <sup>3</sup>	0·4312	0·3255	0·759	—	0·5208	—	1·476
		Iron	Fe O CO <sup>3</sup>	0·0039	—	—	—	—	—	—
		Manganese	Mn O CO <sup>3</sup>	—	—	—	—	—	—	—
OXYSALTS.	SESQUICARBONATE OF	Alumina	Al <sup>2</sup> O <sup>3</sup> 3CO <sup>3</sup>	—	—	—	—	—	—	—
	BICARBONATE OF	Soda	Na O 2CO <sup>3</sup>	—	—	—	—	—	—	—
		Potash	KO 2CO <sup>3</sup>	—	—	—	—	—	—	—
		Lithia	Li O 2CO <sup>3</sup>	—	—	—	—	—	—	—
		Magnesia	Mg O 2CO <sup>3</sup>	—	—	—	0·078	—	1·956	—
		Lime	Ca O 2CO <sup>3</sup>	—	—	—	0·188	—	0·832	—
		Iron	Fe O 2CO <sup>3</sup>	—	—	—	—	—	0·011	—
		Manganese	Mn O 2CO <sup>3</sup>	—	—	—	—	—	—	—
	BIBORATE OF	Ammonia	NH <sup>4</sup> O 2BO <sup>3</sup>	—	—	—	—	—	—	—
		Soda	Na O 2BO <sup>3</sup>	—	—	—	—	—	—	—
GASES.	ORENATE AND APOCRENATE OF Iron	3FeO C <sup>24</sup> H <sup>12</sup>	—	—	—	—	—	—	—	—
	ORGANIC MATTER	2FeO C <sup>48</sup> H <sup>12</sup>	—	not det <sup>d</sup>	—	—	0·117	—	—	—
	NITROGENOUS ORGANIC MATTER	—	—	—	—	—	—	—	—	—
	Loss	—	—	—	—	—	—	—	0·021	—
	TOTAL MINERAL AND ORGANIC MATTERS	—	—	19·7016	12·7955	20·024	12·723	15·6372	10·701	5·3
	Sulphuretted Hydrogen	HS	—	—	—	—	—	—	—	—
	Carburetted Hydrogen	CH <sup>2</sup>	—	—	—	—	—	—	—	—
	Carbonic Acid	CO <sup>2</sup>	—	—	—	—	—	—	—	—
	Atmospheric Air	—	—	—	—	—	—	—	—	—
	Nitrogen	N	—	—	—	—	—	—	—	—
GASES.	Oxygen	O	—	—	—	—	—	—	—	—
	Sulphuretted Hydrogen	HS	—	—	—	—	—	—	—	—
	Carburetted Hydrogen	CH <sup>2</sup>	—	—	—	—	—	—	—	—
	Carbonic Acid	CO <sup>2</sup>	—	68·16	12·256	—	—	59·511	—	—
	Atmospheric Air	—	—	—	20·000	—	—	16·511	—	—
	Nitrogen	N	—	—	—	—	—	—	—	—
	Oxygen	O	—	—	—	—	—	—	—	—
	PURE WATER in 1,000 parts, by weight	HO	—	980·2984	987·2045	979·883	987·277	984·3628	989·299	984·4
	Weight of Aperient Principles	—	—	17·4669	10·9567	—	—	14·1682	—	—

‡ Alkaline nitrates.

§ Extensive resiniform matters.



CENTRAL ITALY.				LEGHORN			PISA			FLORENCE	
ACIDULOUS AND ACIDULOUS CHALYBEATE SPRINGS,				Acqua Marziale forte di Rio	Acqua della Vigneria, Rio	Acqua di Ochibolleri, near Leghorn	Acqua di Chiocinella, near P'ulax	Acqua di Oscianna, or Baths of Aquil, near Lari	Acqua acidula di S. Quirico, near Rosignano	Val d'Elle	
West of the Apennines.										Acqua di S. Giorgio, near Poggibonsi	Acqua di Luliano, near Certaldo, Montalupo
s M, Medicinal; B, Baths; D, Donches.				Calamai	Calamai	Orosi	Calamai	Targioni-Tozzetti	Calamai	Cozzi	Taddei
Analyst				1847	1847	1845	1844	1857	1847	1855	1867
Date of Analysis				M	M		B	B	M B		M
USE OF THE SPRING <sup>a</sup>				16111							

+ Probably the sulphates of soda and alumina form a double salt.

‡ Extractive matter.

§ Aluminic acid and resinous matters.

## SIENNA

[illegible]

53½ air = 55½ Fahr.

a B, Baths; D, Douches; I, Internal.

**Analyst.**

Date of Analysis, -

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CENTRAL ITALY.				PARMA		BOLOGNA		RAVENNA		
SALINE SPRINGS,										
East of the Apennines.										
a M, Medicinal; B, Baths; D, Douches.										
Analyst, - - - - -				Acqua di Salse Maggiore		Montrone		Castel S. Pietro		Acqua Salse-amara di Tossignano
Date of Analysis, - - - - -								Sgarzi		Sgarzi
USE OF THE SPRING, - - - - -				B						I
TEMPERATURE,		Centigrade	- - -			18°				17°
		Fahrenheit	- - -			64½°				62½°
SPECIFIC GRAVITY		- - -	- - -			1.0152				1.0255
		- - -	- - -							1.0017
HALOID SALTS.	CHLORIDE OF	Sodium	Na Cl	0.0443	24.1299	19.990	44.8282	28.590	24.0084	
		Potassium	K Cl	0.0046	-	-	-	-	-	
		Ammonium	NH <sup>4</sup> Cl	-	-	-	-	-	-	
		Magnesium	Mg Cl	9.0802	5.6862	0.660	1.8478	0.670	0.7761	
		Calcium	Ca Cl	9.1766	2.6973	-	4.1697	7.980	0.0565	
	IODIDE OF	Iron	Fe Cl	-	-	-	-	-	-	
		Sodium	Na I	0.0038	-	0.003	*	0.070	0.0414	
		Potassium	K I	-	-	-	-	-	-	
	BROMIDE OF	Magnesium	Mg I	-	-	-	-	-	-	
		Base not specified	R I	-	-	-	-	-	-	
OXYDES	BROMIDE OF	Sodium	Na Br	-	-	-	-	-	-	
		Potassium	K Br	-	-	-	-	-	-	
		Magnesium	Mg Br	0.0061	-	-	-	-	-	
	FLUORIDE OF	Base not specified	R Br	-	-	-	-	-	-	
		Calcium	Ca F	-	-	-	-	-	-	
		Sodium	Na S	-	-	-	-	-	-	
	SULPHIDE OF	Calcium	Ca S	-	-	-	-	-	-	
		Base not specified	R S	-	-	-	-	-	-	
		Manganese	Mn O	-	-	-	-	-	-	
		Iron	Fe O	0.0008	-	-	-	-	-	
OXYALS.	SESQUIOXYDE OF	Aluminium (Alumina)	Al <sub>2</sub> O <sub>3</sub>	-	-	0.004	-	-	-	
		Silicium (Silica)	Si O <sub>2</sub>	-	-	-	-	-	0.0587	
		Iron	Fe <sup>2</sup> O <sup>3</sup>	-	-	-	-	-	-	
	NITRATE OF	Soda	NaO. NO <sup>5</sup>	-	-	-	-	-	-	
		Potash	KO. NO <sup>5</sup>	-	-	-	-	-	-	
		Soda	NaO. SO <sup>3</sup>	-	-	-	0.1711	-	0.2626	
	SULPHATE OF	Potash	KO. SO <sup>3</sup>	-	-	-	-	-	-	
		Ammonia	NH <sup>4</sup> O. SO <sup>3</sup>	-	-	-	-	-	-	
		Magnesia	MgO. SO <sup>3</sup>	-	-	0.002	0.0342	-	-	
		Lime	CaO. SO <sup>3</sup>	-	2.6244	*	1.2832	0.130	0.0562	
OXYALS.	PHOSPHATE OF	Iron	FeO. SO <sup>3</sup>	-	-	-	-	-	-	
		Iron (Sesquisalt)	Fe <sup>2</sup> O <sup>3</sup> . 3SO <sup>3</sup>	-	-	-	-	-	-	
		Alumina	Al <sup>2</sup> O <sup>3</sup> . 3SO <sup>3</sup>	-	-	-	-	-	-	
	CARBONATE OF	Alumina	Al <sup>2</sup> O <sup>3</sup> . 3PO <sup>5</sup>	-	-	-	-	-	-	
		Lime	CaO. 2PO <sup>5</sup>	-	-	-	-	-	-	
		Base not specified	RO. PO <sup>5</sup>	-	-	-	-	-	-	
	SESQUICARBONATE OF	Soda	NaO. CO <sup>3</sup>	-	-	-	-	-	-	
		Potash	KO. CO <sup>3</sup>	-	-	-	-	-	-	
		Lithia	LiO. CO <sup>3</sup>	-	-	-	-	-	-	
	BICARBONATE OF	Magnesia	MgO. CO <sup>3</sup>	-	-	0.003	0.4277	0.260	-	
Lime		CaO. CO <sup>3</sup>	-	-	0.020	0.7699	*	0.0617		
Iron		FeO. CO <sup>3</sup>	-	-	*	0.0085	*	0.0001		
BIBORATE OF	Manganese	MnO. CO <sup>3</sup>	-	-	-	-	-	-		
	Alumina	Al <sup>2</sup> O <sup>3</sup> . 3CO <sup>3</sup>	-	-	-	-	-	-		
	Soda	NaO. 2CO <sup>3</sup>	-	-	-	-	-	-		
CRENATE AND APOCRENATE OF IRON	Potash	KO. 2CO <sup>3</sup>	-	-	-	-	-	-		
	Lithia	LiO. 2CO <sup>3</sup>	-	-	-	-	-	-		
	Magnesia	MgO. 2CO <sup>3</sup>	-	3.8637	-	-	-	-		
ORGANIC MATTER	Lime	CaO. 2CO <sup>3</sup>	-	-	-	-	-	-		
	Iron	FeO. 2CO <sup>3</sup>	-	-	-	-	-	-		
	Manganese	MnO. 2CO <sup>3</sup>	-	-	-	-	-	-		
NITROGENOUS ORGANIC MATTER	Ammonia	NH <sup>4</sup> O. 2BO <sup>5</sup>	-	-	-	-	-	-		
	Soda	NaO. 2BO <sup>5</sup>	-	-	-	-	-	-		
	3FeO. C <sub>24</sub> H <sub>12</sub>	-	-	-	-	0.1711	0.200	0.1499		
LOSS	2FeO. C <sub>48</sub> H <sub>12</sub>	-	-	-	-	-	-	-		
	-	-	-	-	-	-	-	-		
	-	-	-	-	-	-	-	-		
GASES.	TOTAL MINERAL & ORGANIC MATTERS	-	-	-	-	-	0.3644	-	0.042	
		-	-	-	-	-	-	-	-	
		-	-	-	-	-	-	-	-	
	By weight.	Sulphuretted Hydrogen	HS	-	39.0016	-	54.0758	-	25.515	
		Carburetted Hydrogen	CH <sup>4</sup>	-	-	-	-	-	-	
		Carbonic Acid	CO <sup>2</sup>	-	-	0.242	-	0.325	-	
	By volume.	Atmospheric Air	-	-	-	-	-	-	-	
		Nitrogen	N	-	-	-	-	-	-	
		Oxygen	O	-	-	0.153	-	0.162	-	
	Sulphuretted Hydrogen	-	HS	-	-	-	-	-	-	
Carburetted Hydrogen		CH <sup>4</sup>	-	-	-	-	-	-		
Carbonic Acid		CO <sup>2</sup>	-	-	-	-	-	-		
Atmospheric Acid	-	-	-	-	-	-	-	-		
	GASES.		Nitrogen	N	-	-	-	-	14.4°	
			Oxygen	O	-	-	-	-	-	28.8°
PURE WATER in 1,000 parts, by weight			HO	-	-	978.893	-	961.513	-	
Weight of Aperient Principles,	-	-	0.1245	33.6796	20.655	47.3090	29.520	25.0471		
	-	-	-	-	-	-	-	-		
	-	-	-	-	-	-	-	-		
not determined	-	-	-	-	-	-	-	-		
	-	-	-	-	-	-	-	-		
	-	-	-	-	-	-	-	-		
}	-	-	-	-	-	-	-	-		
	-	-	-	-	-	-	-	-		
	-	-	-	-	-	-	-	-		



CENTRAL ITALY.			LESNORM		GROSSETO		SIENNA				
SULPHUROUS SPRINGS.			Acqua Puzzolente	Bagnia Morba		Val di Marce		Val			
West of the Apennines.				Baths of S. Michele	Acqua della Perla	Acqua di Casto Cotto	Acqua di Macerata or Bagno del Doccio, Monticchio	Baths of Petriolo Monticchio	Bagnocaldo di Rapolano (Hot Spring)	S. Giacomo a Polignano (Warm Spring)	
a M, Medicinal; B, Baths; D, Douches.											
Analyst			Oppe	Matteucci	Targioni- Tozzetti	Matteucci	Giulj	Giulj	Targioni- Tozzetti	Guonamici	
Date of Analysis			1845	1841	1855	1841	1834	1834	1835	1855	
USE OF THE SPRING a	Centigrade	—	B M	B		B	B	B M	B	B	
	Fahrenheit	—	—	50°	40°-25	42°-04	41°-25	45°	39°-37	35°-82	
TEMPERATURE		—	—	122°	115°	108°	106°	113°	102°	96°	
SPECIFIC GRAVITY		—	1·0036	1·0003	1·0005	1·0001	—	—	1·0046	1·0037	
HALOID SALTS.	CHLORIDE OF	Sodium	Na Cl	0·1826	0·096	0·039	0·043	0·83	2·50	0·0473	0·0505
		Potassium	K Cl	—	—	—	—	—	—	—	—
		Ammonium	NH <sup>+</sup> Cl	—	—	—	—	—	—	—	—
		Magnesium	Mg Cl	0·0975	—	—	—	0·14	0·97	0·0341	0·0991
		Calcium	Ca Cl	—	0·017	—	—	—	—	0·0140	—
	IODIDE OF	Iron	Fe Cl	—	—	—	—	—	—	—	—
		Sodium	Na I	—	—	—	—	—	—	—	—
		Potassium	K I	—	—	—	—	—	—	—	—
	BROMIDE OF	Magnesium	Mg I	—	—	—	—	—	—	—	—
		Base not specified	R I	—	—	—	—	—	—	—	—
FLUORIDE OF	Sodium	Na Br	—	—	—	—	—	—	—	—	
	Potassium	K Br	—	—	—	—	—	—	—	—	
	Magnesium	Mg Br	—	—	—	—	—	—	—	—	
SULPHIDE OF	Base not specified	R Br	—	—	—	—	—	—	—	—	
	Calcium	Ca F	—	—	—	—	—	—	—	—	
	Sodium	Na S	—	—	—	—	—	—	—	—	
OXYDES.	OXYDE OF	Calcium	Ca S	—	—	—	—	—	—	—	—
		Base not specified	R S	—	—	—	—	—	—	—	—
		Manganese	Mn O	—	—	—	—	—	—	—	—
	SESQUIOXIDE OF	Iron	Fe O	—	—	—	—	—	—	—	—
		Aluminium (Alumina)	Al <sup>2</sup> O <sup>3</sup>	—	—	0·013	—	—	—	—	—
		Silicium (Silica)	Si O <sup>2</sup>	0·0869	0·007	0·011	0·022	—	—	0·0298	0·0129
	NITRATE OF	Iron	Fe <sup>2</sup> O <sup>3</sup>	—	—	0·014	—	—	—	—	—
		Soda	NaO. NO <sup>5</sup>	—	—	—	—	—	—	—	—
	SULPHATE OF	Potash	KO. NO <sup>5</sup>	—	—	—	—	—	—	—	—
		Base not specified	RO. PO <sup>5</sup>	—	—	—	—	—	—	—	—
Soda		NaO. SO <sup>3</sup>	0·5428	0·066	0·022	0·004	0·55	0·69	0·3672	0·4767	
OXYSALTS.	PHOSPHATE OF	Potash	KO. SO <sup>3</sup>	0·0312	—	—	—	—	—	—	—
		Ammonia	NH <sup>4</sup> O. SO <sup>3</sup>	—	—	—	—	—	—	—	—
		Magnesia	MgO. SO <sup>3</sup>	0·3939	—	—	—	0·42	0·3548	0·5430	—
	CARBONATE OF	Lime	CaO. SO <sup>3</sup>	1·4590	0·927	—	—	0·28	0·28	0·3939	0·1315
		Iron	FeO. SO <sup>3</sup>	—	—	—	—	—	—	—	—
		Iron (Sesquisalt)	Fe <sup>2</sup> O <sup>3</sup> . 3SO <sup>3</sup>	—	—	—	—	—	—	—	—
	BIBORATE OF	Alumina	Al <sup>2</sup> O <sup>3</sup> . 3SO <sup>3</sup>	—	—	—	—	—	—	—	—
		Alumina	Al <sup>2</sup> O <sup>3</sup> . 3PO <sup>5</sup>	—	—	—	—	—	—	—	—
		Lime	CaO <sub>2</sub> . PO <sup>5</sup>	—	—	—	—	—	—	—	—
	BIBORATE OF	Base not specified	RO. PO <sup>5</sup>	—	—	—	—	—	—	—	—
Soda		NaO. CO <sup>2</sup>	—	—	—	0·089	—	—	—	—	
Potash		KO. CO <sup>2</sup>	—	—	—	—	—	—	—	—	
GASES.	CARBONATE OF	Lithia	LiO. CO <sup>2</sup>	—	—	—	—	—	—	—	—
		Magnesia	MgO. CO <sup>2</sup>	0·0102	0·004	—	0·139	0·14	0·21	0·1026	0·1294
		Lime	CaO. CO <sup>2</sup>	0·4533	0·008	—	0·352	1·25	0·28	3·3759	1·7446
	BIBORATE OF	Iron	FeO. CO <sup>2</sup>	0·0186	—	—	—	0·07	0·07	—	—
		Manganese	MnO. CO <sup>2</sup>	—	—	—	—	—	—	—	—
		Strontia	SrO. CO <sup>2</sup>	—	—	—	—	—	—	—	—
	BIBORATE OF	Alumina	Al <sup>2</sup> O <sup>3</sup> . 8CO <sup>2</sup>	—	—	—	—	—	—	—	—
		Soda	NaO. 2CO <sup>2</sup>	—	—	0·094	—	—	—	—	—
		Potash	KO. 2CO <sup>2</sup>	—	—	—	—	—	—	—	—
	BIBORATE OF	Lithia	LiO. 2CO <sup>2</sup>	—	—	—	—	—	—	—	—
Magnesia		MgO. 2CO <sup>2</sup>	—	—	0·058	—	—	—	—	—	
Lime		CaO. 2CO <sup>2</sup>	—	—	0·228	—	—	—	—	—	
GASES.	BIBORATE OF	Iron	FeO. 2CO <sup>2</sup>	—	—	—	—	—	—	—	—
		Manganese	MnO. 2CO <sup>2</sup>	—	—	—	—	—	—	—	—
		Ammonia	NH <sup>4</sup> O. 2BO <sup>5</sup>	—	—	—	—	—	—	—	—
	BIBORATE OF	Soda	NaO. 2BO <sup>5</sup>	—	—	—	—	—	—	—	—
		CRENATE AND APOCRENATE OF Iron	3FeO. 24H <sup>2</sup> O	—	—	—	—	—	—	—	—
		ORGANIC MATTER	2FeO. C <sub>48</sub> H <sub>112</sub>	0·0802	0·043	0·008	0·006	—	—	0·0239	0·0131
	BIBORATE OF	NITROGENOUS ORGANIC MATTER	—	—	—	—	—	—	—	—	—
		Loss	—	—	—	—	—	—	—	—	—
		TOTAL MINERAL & ORGANIC MATTERS	—	3·3562	0·268	0·487	0·660	3·26	5·42	4·7735	3·208
	GASES.	By Weight.	Sulphuretted Hydrogen	HS	0·0263	—	22·75	not detd.	—	0·11	0·2666
Carburetted Hydrogen			CH <sup>4</sup>	—	—	—	—	—	—	—	—
Carbonic Acid			CO <sup>2</sup>	0·1394	—	—	0·342	0·03	0·04	0·8767	1·24
By Volume.		Atmospheric Air	—	—	—	—	—	—	not detd	0·071	—
		Nitrogen	N	—	—	—	—	0·03	—	—	—
		Oxygen	O	—	—	—	—	0·01	—	—	—
By Volume.		Sulphuretted Hydrogen	HS	17·18	—	22·75	—	—	76·6	8·56	133·826
		Carburetted Hydrogen	CH <sup>4</sup>	—	—	—	—	—	—	—	—
		Carbonic Acid	CO <sup>2</sup>	70·41	—	233·70	—	—	28·8	23·20	827·18
By Volume.		Atmospheric Air	—	—	—	—	—	—	—	2·63	74·02
	Nitrogen	N	—	—	18·18	—	—	—	—	—	
	Oxygen	O	—	—	—	—	—	—	—	—	
GASES.	By Volume.	PURE WATER in 1,000 parts, by weight	HO	996·4781	999·733	998·672	998·989	996·67	994·13	994·0832	996·342
		Weight of	—	—	—	—	—	—	—	—	—

[illegible]

## JAPAN.

West Gallery of Transept.

**1 ALCOCK, Sir RUTHERFORD, K.C.B. H. M. Minister Plenipotentiary in China.**—Sundry bronzes, the finest specimens of Japanese art. 45 medallion repoussé metal brooches, illustrating Japanese art, manners and customs. 40 choicely carved ivory figures and groups, illustrating Japanese progress in art, their manners, religion, and customs. Embossed imitation leather despatch box; small fine lacquer red saucer; covered box; box with gold vine leaf; eggshell porcelain cups; gold-lacquered ivory scent-box; two of the Prince of Choria's bank-notes; specimens of current coins; specimens of Japanese pottery; illustrated books—nine octavo volumes of woodcuts, coloured and plain—arts, manners, customs, and religion; nine folio volumes; three maps—Yedo, the Tycoon's capital; Osaka, the commercial emporium; Kioto, or Miako, capital of the Mikado. Book of patterns (cotton fabrics); roll of coloured woodcuts; a rolling blind of "rice glass," said to be made of pounded rice, siler, and potash; small sword of one of the assassins, left in the Legation at Yedo on the night of the attack; leather purse, money, and seal; hanging lamp of bronze from Osaka; finely tempered blade for a two-headed sword, with silk case; circular rice-bowl and cover; large tazza; large lacquered box; writing box; gold lacquered box, with pheasants on lid; despatch box, large; small leather do.; small bronze vase; bronze inlaid water can (antique); candlestick; water bottle (melon shape); pen-rest, leaves; do. serpent; two pipe stems; bronze circular saucer; several studs or brooches of metal work; square lacquer tray; small oblong gilt lacquer tray; small nest of boxes; small tobacco-box; sundry small boxes, &c.

**2 DUCAN, C. W. St. John's Enniscorthy, co. Wexford.**—Cyclopaedia, illustrated and bound; Polyglot lexicon, Japanese, French, English, and Low German; scientific work, comprising treatises on anatomy, botany, zoology, physics, illustrated; telescope in paper case; eggshell porcelain; cups, saucers, and bowls, turned out of wood, almost as thin as porcelain; Japanned spill vases of bamboo cane; Chinese and Japanese locks; slippers; tooth brush and pick; blue crêpe embroidered in gold and colours for a screen; map of Yedo in colours, a Chinese map of Canton; yellow silk robe embroidered in gold and colours; pith hat on cane frame; Chinese gong and hammer; Chinese calculating frame in ebony and boxwood; small copper box or vase in charcoal, with figures of birds in relief, cover in open work; portfolio of paintings on rice paper, from Foochoo-Foo; feather fan.

**3 HAY, LORD JOHN, R.N. C.B. London.**—Case with fine collection of raw silks, accompanied by statistics of the silk trade of Japan.

**4 SIMMONDS, P. L. 8 Winchester st. S.W. London.**—Curious cable of human hair, very strong; embroidered silks; Japanese lady's head-dress; paper pocket hand-

kerchiefs, and other samples of Japanese paper; silk wadding bag; despatch box.



Japanese Belle.

**5 HEWETT, W. & Co. King William st. London, E.C. and Hong Kong.**—Articles manufactured from paper in imitation of leather; a pair of curious models of Japanese warriors; ancient carvings in ivory; group of female figures, life size, representing a princess at her toilette, and attendants; vases with raised dragons and ornaments; ancient bronze representing a priest riding on a buffalo; pair of Japanese swords; curious shell with painted figures of foxes; Japanese cups, covered with the finest wicker-work; valuable specimens of ancient lac; porcelain; a large model of joss-house; table decorated with raised gold lacquer work; hand screens.



Japanese Ladies at their Toilet.

**6 MEARS, MAJOR.**—Two swords; shield; fan; purse; box of China; paper string; cloths; glass.

**7 WHEELER & WILSON, Liverpool.**—Three framed specimens of rich embroidered silk pictures, beautifully worked by the needle in Japan.



Japanese Head-dress.

## LIBERIA.

## West Gallery.

1 AFRICAN AID SOCIETY, 8 *Adelphi terrace*, W.C. *London*.—Ornamented cotton robe of an African chief; African sandals; carved wooden platter; grass basket, bag, and two dinner mats; gum copal; 17 specimens of indigenous fibres; palm oil nuts (*Elais guineensis*); ground nut oil; ground nuts; cassada meal; starch; coffee in the berry and pulp; sugar, molasses; rough and cleaned rice; ginger; leaves used by natives for dyeing; Calabar beans.

2 RALSTON, G. Consul-General for Liberia, 18 *Trafalgar yard*, *London*.—A bag of pea nuts (*Arachis hypogaea*); large counterpane or quilt, made of pieces of prints by the ladies of Monrovia; one of the largest of the cotton cloths made by the natives in the interior from indigenous cotton; 4 other cloths of different sizes.

## NETHERLANDS.

## East Gallery.

## COMMITTEE.

Mr. MEUSCHERT VAN VOLLENHOVEN, Burgomaster of Amsterdam, *Chairman*.

Mr. C. E. VAILLANT, *Secretary*, of the City of Amsterdam.

Dr. S. SARPATI, Amsterdam.

Mr. J. A. VAN EYK, Amsterdam.

W. J. HOFDIJK, Amsterdam.

Dr. E. H. VON RAUMHAUER, Amsterdam.

J. W. L. VAN OORDE, Rotterdam.

H. L. ENTHOVEN, *Len.*, the Hague.

M. L. HERMANS, the Hague.

CHARLES ECHENYAIN, Esq., Amsterdam, *Secretary and Commissioner in Dublin*.

## SECTION II.—CHEMICAL AND PHARMACEUTICAL PROCESSES AND PRODUCTS GENERALLY.

1 JANSSEN, KNOCCARD, *Wort*, Limburg.—Hard and soft soaps.

2 SANDERS & Co. *Leyden*.—Hard soaps.

3 SMITS & ZOON, *WED. P.* Utrecht.—Sulphate of ammonia.

4 SPRUYT & Co. *Rotterdam*.—Writing, copying, and gall-nuts ink; hartshorn; preventive against bugs, Dutch insect powder; cartridges for extinguishing fire.

5 VERHAENDERT & ZOON, *Dordrecht*.—Varnishes, stand oil, &c.

6 BAX, G. *Rotterdam*.—Oil.

## SECTION III.—SUBSTANCES USED AS FOOD.

6A APKIN & ZOON, *Purmerend*.—Etagdre with durable sweetmeats.

7 BOGAARD, J. V. O. & Co.—*Gennep*, Limburg.—Wheat and flour in various stages of manufacture; flour of rye, &c.

8 BOLS, ERVEN L. *Het Lootje*, Amsterdam.—Liqueurs, spirits, and Hollands.

9 BOOTZ, H. *Amsterdam*.—Liqueurs, spirits, and Hollands.

10 CATZ & ZOON, *Pekel-A.*—Liqueurs, spirits, and Hollands.

11 CHYS & ZOON, *WED. J. VAN DER*, Delft.—Butter, cheese, tea, &c.

12 DRAISMA VAN VALKENBURG, S. *Leeuwarden*.—Cod-liver oil.

13 DUTVIA, JACOB, *Koeg a/d. Zaan*.—Ueling's patent starch.

14 EBERSON, H. P. *Arnhem*.—Liqueurs, spirits, and Hollands.

15 EGBERTS & Co. B. H. *Delfsen*.—Succory.

16 FOCKINK, WYLAND, *Amsterdam*.—Liqueurs, spirits, and Hollands.

16A GENDRINGEN, G. VAN, *Kampen*.—Tobacco.

16F GORTER, G. F., *Dockum*.—Succory.

16G GARANTINE & MADDER MANUFACTORY, *Tiel*.—Garantine and other products of madder.

16H BAAN & SCHIPPERS, DE, *Vlaardingen*.—Garantine.

16I BEUKER & HELANDER, *Amsterdam*.—Samples of refined sugar.

16K MACKENSTEIN & ZOON, A. F. *Amsterdam*.—Twisted tobacco.

16L OFFES, K. VAN, *Harlingen*.—Cigars made of Havannah tobacco.

17 RUITER, R. Ryp, near *Purmenend*.—Conservable rusks, biscuits, cracknells.

18 GROOTER, GEERD. D. & M. *Westma.*—Ices, cocoa, and chocolates.

19 HOOCHWINKLE, J. *Gorinchem*.—Buckwheat in various stages of manufacture.

20 HOPPE, P. *Amsterdam*.—Alcohol; liquors made of madder, potatoes, beetroots, and washing-water of sugar and grain manufactories.

21 HUNCK, H. P. *Amsterdam*.—Chocolate powder.

22 IMMINK, J. *Zwolle*.—Flour.

23 KOPPEN, H. T. *Leerdam*.—Cigars.

24 KORFF & Co., F. *Amsterdam*.—Chocolate powder; chocolate in slices; cocoa-butter, &c.

25 LANS & ZOON, H. *Haarlem*.—Lans beer; East India beer.

26 LEVERT & Co. *Amsterdam*.—Liqueurs, spirits, and Hollands.

27 MOUTON, FL. *Hillegersberg*, near Rotterdam.—Ship-bread and rusks.

28 OOLGAARD & ZOON, D. *Harlingen*.—Liqueurs, spirits, Hollands.

29 PATERS, P. L. *Leyden*.—Buck-wheat.

30 REYNVAAN, A. J. *Amsterdam*.—Cigars, tobacco, snuff.

31 RÖNTGEN, J. E. *Deventer*.—Liqueurs, spirits, Hollands.

32 SPRUYT & Co. *Rotterdam*.—Prepared liver oil, conservable gooseberry juice.

33 STIJDE, GEERD. *Kampen*.—Liqueurs, spirits, Hollands.

34 ULRICH, J. S. & C. *Rotterdam*.—Ship-bread, rusks, and dessert-biscuits.

35 VERWEY, JEN. A. J. *Deventer*.—Cigars.

36 ZUYLEKOM, LEVERT, & Co., VAN, *Amsterdam*.—Purified and rectified alcohol, gin, brandy, fine and ordinary liqueurs, elixir, &c.

## SECTION IV.—VEGETABLE AND ANIMAL SUBSTANCES USED IN MANUFACTURES.

37 SMITS & ZOON, *WED. P.* Utrecht.—Animal charcoal.

## SECTION XI.—COTTON.

38 HOOG, J. A. DE, *Amsterdam*.—Knitted stockings of cotton No. 80.

## SECTION XII.—WOOLLEN AND WORSTED.

39 ZAALBERG & ZOON, J. C., *Leyden*.—Woollen blankets and rugs.

40 SCHULTERS, J. JEN. *Leyden*.—Woollen blankets and rugs.

## SECTION XIV.—MANUFACTURES FROM FLAX AND HEMP.

16B GORTER, H. S. *Dockum*.—Friesland flax and clover seed.

16C GORTER, S. *Dockum*.—Friesland flax and codilla.

16D GORTER, L. H. & Co. *Dockum*.—Friesland flax and codilla.

16E GORTER, HEN. A. *Dockum*.—Friesland flax.

16J MEULEN, N. H. VAN DER, *Ileuswarden*.—Friesland flax.

41 CATZ & ZOON, J. B. VAN, *Gouda*.—Fine cords, fishing-yarn, halters.

42 STROOP & ROOYAKKERS, *Eindhoven*.—Linen, damask, &c.

#### SECTION XVI.—LEATHER, SADDLERY AND HARNESS, SKINS, FURS, FEATHERS, AND HAIR.

43 DEVENTER, J. S. VAN, *Zwolle*.—Fur-cloak, made with inlaid skins of foxes, hares, otters, squirrels, ermines, cats, fitchows, swans, &c., in 25 varieties.

44 GOMPERTZ, W. J. J. *Amsterdam*.—Varnished leather.

45 PILGER, LODEWYK, *Amsterdam*.—Trunks for ladies and gentlemen.

45A THYSSEN & ZOON, W. *Tiel*.—Brushwork.

46 HOLBOORN, A. B. *Arnhem*.—High shoes for sportsmen, and half-boots.

#### SECTION XVII.—PAPER AND STATIONERY, PRINTING AND BOOKBINDING.

46A BUFFA & ZONEN, F. *Amsterdam*.—Illustrated works—Costumes of the Netherlands, East Indies, West Indies, Netherlands' antiquities, Java, &c.

46B SYTHOFF, A. W. *Leyden*.—Books in the Japanese, Chinese, and other languages.

46C SIMONS, P. *The Hague*.—Silken and cotton bands used by bookbinders.

46D WOLTERS, J. B. *Groningen*.—Illustrated books and engravings.

#### SECTION XIX.—CARPETS AND FLOOR-CLOTHS, &c.

47 PRIJS, WED. L. J. *Amsterdam, Arnhem, Deventer*.—Woollen and cow-hair carpets.

#### SECTION XXII.—IRON AND GENERAL HARDWARE.

48 STELLING, J. C. *Amsterdam*.—Bronzed, varnished, and white tin-work; copper, new silver, wrought iron, and iron gauze ware.

49 WESTERN, GEBBS. VAN, *Haarlem*.—Magnet, weighing 6lbs., bearing 88lbs.

#### SECTION XXV.—CERAMIC MANUFACTURE, EARTHENWARE, &c.

50 PRINCE, JAM. & CO. *Gouda*.—Clay tobacco pipes.

51 WANT, AZM. P. J. VAN DER, *Gouda*.—Tobacco pipes (Irish milk maids).

#### SECTION XXVI.—DECORATION, FURNITURE, JAPANNED GOODS, &c.

52 BRUINS, P. A. *Zwolle*.—Door-handles in 23 varieties.

53 NOOTEN, L. J. *Rotterdam*.—Japanned goods, enamelled and encrusted with mother of pearl, illuminated with fine views.

54 ZIEGERS, & ZOON, WED. J. F. *Amsterdam*.—Japanned goods, all enamelled.

55 TYBOUT, C. *Zwolle*.—Antique carved cupboard.

56 LOUMAN, J. *Zwolle*.—Folding-screen with looking glasses.

57 DRILLING, A. *Amsterdam*.—Ladies' work-tables.

#### SECTION XXVII.—MANUFACTURES IN MINERAL SUBSTANCES, &c.

58 HEUKELUM, N. VAN, *Erlecom, near Nymegen*.—Artificial stones and pebbles.

#### SECTION XXIX.—MISCELLANEOUS MANUFACTURES.

59 KACKS, H. T. *Amsterdam*.—Three pictures made of cork.

## ROME.

### East Centre of Transept.

#### COMMISSION APPOINTED 10TH APRIL, 1865.

Baron Comm. P. D. CONSTANTINI BALDINI, Minister of Commerce, Fine Arts, and Public Works, *President*.

Cav. LUIGI TOSI, *Vice-President*.

Comm. LUIGI GRIFI, Secretary-General of Ministry of Commerce, &c., *Secretary*.

Comm. TOMMASO MINARDI, Inspector of Public Pictures.

Comm. P. ERCOLE VISCONTI, Commissary of Antiquities.

Comm. PIETRO TENERANI, Director of the Pontifical Museums and Galleries.

Comm. LUIGI POLETTI.

Cav. FRANCESCO PODESTI.

Cav. GIOVANNI BATTISTA DE ROSSI.

Comm. VIRGINIO VESPIGNANI.

Prof. F. PRATTI.

Cav. G. PONZI.

Comm. N. C. S. BERTOLO.

Cav. N. TROCCHI.

Prof. C. JACOBINI.

Prof. R. VIALE PRELA.

#### SECTION I.—MINING, QUARRYING, METALLURGICAL OPERATIONS, AND MINERAL PRODUCTS.

1 ALTIERI, CARDINAL LUDOVICO, Arch Chancellor of the Roman University.—A geological map of the Tufa mountains and alum mines, made by Prof. Ponzi. A series of 110 specimens illustrating the geological formation of the district, viz., 38 of the aqueous, igneous, and metamorphic rocks; 19 of the metals, viz., iron, lead, zinc, antimony, and mercury; 5 of the refractory rocks; 11 of the salts; 16 of the clays and earths; 15 of marbles; 4 of sulphur; and 1 of combustible.—Price £40.

2 MAMI, COUNTESS ANGELA.—Sulphur rock from the Solfatare at Canale; sulphur extracted from same.

3 ROMAN COMPANY OF IRON MINES AND IRON MANUFACTORIES.—Specimens of semi-wrought iron, and of iron wire; minerals from the Tolfa mountain.

4 MARTINORI, PIETRO.—Disc of Egyptian alabaster—price £33; disc of antique specimens composed of 193 kinds of marble, in geometrical shapes, defined by lines of Nero Antico—price £42; two tables of Egyptian alabaster.

5 ROSSI, CAV. MICHELE STEFANO DE.—Plan of the celebrated subterranean cemetery of Callisto, excavated near the Appian Way, about two miles out of Rome; scale  $\frac{1}{1000}$  obtained by the iconographic machine, rewarded with a medal at the Exhibition in London in 1862. Geological and architectural section taken from the heart of the hill, showing the strata, the levels, and the proportions in which the cuniculi are excavated; specimens of Tufa from the strata.

#### SECTION II.—CHEMICAL AND PHARMACEUTICAL PROCESSES, AND PRODUCTS GENERALLY.

6 THE BOARD OF COMMERCE, FINE ARTS, AND PUBLIC WORKS.—A candle painted in arabesques, surrounding an image of St. Peter, and under this the arms of Pius IX., by Signor Michele Vizia—price £6.

7 CASTRATI, GIOVANNI BATTISTA.—Wax candles, value £31.

8 THE SAVORELLI PATRIMONY, *Giannicola*.—Stearine candles, value £1.

#### SECTION III.—SUBSTANCES USED AS FOOD.

9 NAZZARI, PIETRO.—Liqueurs (Rosollos), viz., Curaçoa, Maraschino, Chartreuse, Alkermes; cherry brandy; anisette; Mandarin orange; simple chocolate; chocolate à la Vanille; chocolate sante; confits.

10 TUCCI, BENEDETTO.—Four bottles of olive oil from the Zancali estate, Pagliano.

## SECTION VII.—CIVIL ENGINEERING, &amp;c.

11 ANGELIS, BERNARDINO DE.—Model exhibiting improvements on railways.—(*In Machinery Court.*)

## SECTION VIII.—ORDNANCE, ARMOUR, AND ACCOUTREMENTS, &amp;c.

12 TORTI, TOMASO.—A revolver, with bayonet and accompaniment; double-barrelled gun, of a new design, with accompaniments.—Prices £35 and £40.

## SECTION XVII.—STATIONERY, BOOK-BINDING, &amp;c.

12a VILLA, G.—Large ledger, bound in brass Roman work.

## SECTION XIX.—TAPESTRY, CARPETS AND FLOOR-CLOTHS, LACE AND EMBROIDERY, FANCY AND INDUSTRIAL WORKS.

13 FERRARI, Monsignor D. CIBIACO, President of the Hospital of San Michele.—Tapestry carpet (alt line), after an antique Mosaic in the Lateran Museum, of the supper described by Pliny, size 256 square Roman palms—price £165; carpet in imitation of the Persian, never before made in Rome—price £5.

14 ADMINISTRATION OF ROMAN PRISONS.—Lace worked by the prisoners in the Penitentiary at the Baths of Diocletian, a l'antique—value £25; lace, "application de Bruxelles;" guipure in black silk; antique lace made with the needle; piece of linen, showing various work in embroidery, cross-stitch, network, flowers in point d'Angleterre and point d'Alençon—value of these, £20.

## SECTION XXIII.—WORKING IN PRECIOUS METALS, AND IN THEIR IMITATIONS; JEWELLERY, AND ALL ARTICLES OF VERTU AND LUXURY, NOT INCLUDED IN THE OTHER CLASSES.

15 DIER, GIOVANNI.—Tables in Mosaic:—1. Views of Rome, in the Pompeian style—price £60; 2. Same, with tazza and doves of the Capitol—price £40; 3. Same, smaller—price £28; 4. Same, with peasant girl in centre—price £22; 5. Birds and flowers—price £18.

16 SAULINI, CAV. LUIGI.—Eighteen shell cameos; two cameos in pietra dura; head of Pio IX. in smalto bianco.

17 PONI, VITTORIA.—Roman pearl necklace of twelve rows—£25; and necklace of four rows—£25; ditto, of imitation rose-coral—£23.

18 RINALDI, COSTANTINO.—Mosaic representing a stag hunt—price £100.

19 BARBIERI, Commendatore M. A.—Mosaic representing Alexander I. Emperor of Russia—£200; tables in Mosaic:—1. Red ground with flowers—£25; 2. Same, with lion in centre; 3. Same, with panther; 4. Italy; 5. Cathedral of Milan; 6. Ducal Palace—£15 each; Nine paper weights in Mosaic; box containing five subjects thrice repeated, to show three qualities of workmanship—artistic, second-rate, and ordinary; box containing jewellery in Mosaic, artistic work only. The jewellery by mistake exhibited in Malta—(See p. 350.)

20 VERDONANI, RAFFAELLO.—Box relief in ivory representing the Immaculate Conception; the frame of ebony and ivory—price £100.

21 RICCIARDI, LUIGI.—Two Mosaic tables, one having flowers in the centre, encircled by birds and leaves—price £45; the other, flowers and ornaments on a white ground—price £55.

22 GIRAUD, His Excellency DOMENICO, Steward and Secretary of the building of St. Peter, President of the Mosaic Works of the Vatican.—Mosaic, St. Peter, after Guido—price £531 5s.; do., the Madonna, after Sassoferrato—£637 10s.

23 PAULETTI, FRANCESCO.—Small Mosaic, the Roman Forum—price £17.

24 BARNOTTI, BEATO.—Mosaic, the Roman Forum—£22 5s.; do. the Pantheon—£22; small oval Mosaic, the Roman Forum; do., the Temple of Vesta—£3 each.

25 FERRARI, His Excellency Monsignor GIUSEPPE, Treasurer-General and Minister of Finance to His Holiness Pius IX.—A collection of twenty-five bronze medals, coined in the Pontifical mint, under the direction of Commendatore Giuliope Masio, from the Pontificate of Pope Pius VII. to the eighteenth year of the reign of the present Pope, and bearing on the obverse the following portraits, viz.:—1, 2, 3, and 4, of Pope Pius VII.; 5 and 6, of the sculptor Canova; 7 and 8, of Leo XII.; 9, of Pius VIII.; 10, 11, and 12, of Gregory XVI.; 13, of the celebrated painter Pietro Perugino; and the rest of the collection, of the reigning Pontiff.

26 THE SAVORELLI PATRIMONY.—Slab of Carrara marble for a table, inlaid with engravings executed, in a novel and secret manner, on lithographic stone without a graver—price £20.

27 SAULINI, CAV. LUIGI.—Mosaic picture (Holy Family), after Sassoferrato, in the Dorian Gallery—£127 10s.

28 ANTONELLI, His Excellency Cardinal GIACOMO.—Cameo in white pietra dura on a dark ground, representing St. George and the Dragon, by Lanzi. This cameo is of the most exquisite character, and was mounted expressly for Dublin in very splendid style. Oval in form, the stone is somewhat larger than a half-crown piece. The outside border or cornice is of gold enamel, of the colour of rubies, the second of emerald, and the inner cornice of gold, enamelled with rubies.

29 PINET, EMMET.—Collection of cameos, intaglias, &c., by Girometti, Martini, and other eminent artists, and jewellery after the antique, Etruscan, and Roman, contained in four frames.

30 PETAGNA, MICHELE.—Album containing portraits of all the Popes from St. Peter to the present Pontiff, Pius IX., from the series in the Basilica of St. Paul's beyond the walls, price 34s.; another, smaller, price 17s.; photograph of the Panorama of Rome taken from Tasso's Oak, in frame, price £3; "Flowers of Antique Sculpture," album containing 55 photographs, with description by Commendatore P. E. Visconti, price £2.

31 LUSWERGH, GIACOMO.—Nine photographs of pictures and sculpture; five views and five portraits.—(*In Photographic Room, No. 155.*)

32 OLIVIERI, LEONARDO.—Volume of photographs of the monuments of the Lateran Museum, with descriptions by Father Garucci, of the Jesuits (the binding in parchment by the exhibitor), price £10; volume of photographs, entitled "Science and Art under the Pontificate of Pius IX.," price £6.

33 FERRARI, Monsignore GIUSEPPE, Minister of Finance and Treasurer-General of his Holiness, Government Engraving Establishment.—Portfolio containing 63 proofs of the best engravings executed by the chief Roman engravers after the paintings of Raphael, Giulio Romano, Benvenuto Garofalo, Pozzo, Desenzichino, Guido, Daniel di Volterra, and others; portfolio with 26 proofs of engravings by the same hands; portfolio with 12 proofs representing incidents in Roman history, from paintings by Visconti Camastucci; volume containing 17 proofs of outline engravings, slightly shaded, from paintings by Beato Angelico in the chapel of Pope Nicholas V., in the Vatican, representing incidents in the lives of St. Stephen and St. Lawrence; volume containing 12 proofs of engravings (mezza macchia) of scenes from the Old and New Testaments, from paintings in the Sistine Chapel by Sandro Botticelli, Domenico Ghirlandajo, Cosimo Rosselli, Luca Signorelli, Pietro Perugino, and Bartolomeo della Gatta; volume containing 45 engravings in outline of the most admired fragments of Greek, Etruscan, and fifteenth century sculpture.

34 GOVERNMENT ESTABLISHMENT OF CHROMO-LITHOGRAPHY, directed by Cav. Michele Stefano De Rossi.—Chromo-lithographic reproductions of the early Christian

monuments; specimen of the litho-topographic system, by which are printed the critico-chronological plates of the universal history of the Church; reliquary executed in 1864 from the design of Commendatore Poletti.

#### SECTION XXVII.—MANUFACTURES IN MINERAL SUBSTANCES USED FOR BUILDING OR DECORATION, &c.

35 DURI, BALDASSARE, & Co.—Bricks of a plastic composition, coloured in imitation of natural stones, cold-pressed, for pavements.

### RUSSIA.

East Gallery.

#### SECTION XVI.

1 NISSEN, W. *St. Petersburg and London*.—Russian leather travelling articles.

The following letter explains the absence of Russian exhibits.

Foreign Office, April 11, 1865.

Sir,

With reference to my letter of the 17th of February last, I am directed by Earl Russell to request you will acquaint the Executive Committee of the Dublin Exhibition, that the Russian Ambassador at this Court has informed his Lordship that in consequence of the difficulty of transport and the shortness of the time before the opening of the Exhibition, the Russian Government will be prevented from exhibiting anything, but that in order to show the interest they take in that important and useful undertaking, they have appointed a Special Commissioner to assist at the opening of the Exhibition, and to study its details, and that M. Kamensky, who filled the same appointment at the London Exhibitions in 1851 and 1862, has been again selected for that purpose.

I am, Sir,

Your most obedient humble servant,

(Sig.) E. HAMMOND.

C. E. Bagot, Esq.

### S I A M.

West Gallery.

SIMMONDS, P. L. 8 Winchester st. London, S.W.—Various rich fabrics and raw materials.

### SWEDEN AND NORWAY.

East Gallery.

#### SECTION V.

1 HEFFVERMEHL, L. *Drammen*.—A cariole; a sledge.

#### SECTION X.

2 BREHMER, E. T. *Stockholm*.—A tellurium for the use of schools.

#### SECTION XVII.

7 DALMAN, C. E.—Map of the district of Carlstad, Sweden.

8 ERDURUM, Prof. AXEL.—Geological maps of Sweden.

9 ECONOMIC CHART WORKS, *Stockholm*.—Royal economic maps of the kingdom of Sweden.

10 HUNT, T. C. British Consul, *Stockholm*.—Portfolio of photographic landscapes from paintings by the King of Sweden.

11 HYDROGRAPHIC OFFICE, *Stockholm*.—Swedish sea maps.

12 KIERKEGAARD, *Gothenburg*.—Works on ship-building.

13 LJUNGBERG, G. *Stockholm*.—Economical and statistical maps of different districts in Sweden.

14 MEYER & Co. *Stockholm*.—Portrait of King Charles XV. of Sweden (oil print).

15 SWANSTRÖM & Co. *Stockholm*.—One year in Sweden, lithographic prints of the customs in Sweden.

16 ROYAL RAILWAY OFFICE, *Stockholm*.—Railway map of Sweden.

17 SMITH, A.—Lithographic prints, representing edible and poisonous mushrooms.

18 TOPOGRAPHIC CORPS.—Ordnance topographical maps.

19 ROSEN, Count, *Stockholm*.—Svenska Sigiller från Medeltiden; seals from the middle ages, by Emil Hildebrand.

#### SECTION XXVI.

3 MELJERBERG, C. G. *Stockholm*.—Furniture for schools; a globe.

#### SECTION XXVI.\*

4 BONNIER, A. *Stockholm*.—Swedish and Norwegian uniforms; the different races of Sweden.

5 MANDELGREN, N. M.—Scandinavian monuments of the olden times, with the paintings and other ornaments belonging to them.

#### SECTION XXIX.

6 MANILLA INSTITUTE FOR THE BLIND, DEAF, AND DUMB, *Stockholm*.—Various apparatus for the blind; articles manufactured by them.

### SWITZERLAND.

East Gallery of Transept, opposite Apse.

#### SECTION II.—CHEMICAL AND PHARMACEUTICAL PROCESSES AND PRODUCTS GENERALLY.

1 HENNER & Co. *Wyl, St. Gall*.—Chemical products.

2 LÖTSCHER, BROTHERS, *Marbach, Lucerne*.—Sugar of milk.

3 OPLIGER-GEISER, *Langenthal*.—Essence of coffee.

#### SECTION III.—SUBSTANCES USED AS FOOD.

4 BOUVIER, *Neuchâtel*.—Sparkling wines.

5 CAILLER, F. L. *Vevey, Vand*.—Chocolate.

6 CHERVAL, UN CHEVALIER, *Vétroz, near Sion, Valais*.—Wines from the Valais.

7 ORMOND & Co. *Vevey and Geneva*.—Cigars.

8 TAVERNEY, H. *Vevey*.—Cigars.

9 WARNERY, H. *Payerne*.—Cigars.

#### SECTION X.—HOROLOGICAL INSTRUMENTS, &c.

10 LEHMANN, Ch. *Bienn*.—Patent remontoir for watches.

#### SECTION XV.—MIXED FABRICS AND SHAWLS.

11 HESS BRUGGER A. *Amriswil, Thurgovie*.—Knitted articles.

#### SECTION XXVI.—DECORATION, FURNITURE AND UPHOLSTERY.

11 KLAUS, P. *Wyl, St. Gall*.—Case carved in oak.

12 WEINGART, J. *Ammerswyl, Berne*.—Small barrels of oak.

### TURKEY.

MACROPODARI, A. S. *Merchant, Smyrna*.—Figs and raisins.—(West Gallery.)

## UNITED STATES.

## South-west Corner, Machinery at Rest Court.

- 1 WARD, W. H. *New York*.—Pomade.—[SECTION II.]  
 2 Model of a first class American railway carriage, with fresh and foul air ventilators, self acting breaks; working models and drawings of railway carriage and engine turn tables.—[SECTION V.] 3 Day signal flags; fog signals, and the means for effecting the permutations; night signals and alphabet, &c.; signal telegraph instrument; steering signal telegraph and lantern; signal books and illustrative plates; signal and other lanterns.  
 4 Machine for making bullets.—[SECTION VIII.]  
 5 Maps of the United and Southern States, and books.—[SECTION XVIII. (B).]  
 6 Self-adapting box and trunk handles.—[SECTION XXII.]

## ZOLLVEREIN—PRUSSIA.

## South-west Transept and South Gallery of Transept.

The following official letter explains the action taken in Prussia.

Berlin, November 9, 1864.

The undersigned has the honour to inform Mr. William Lowther, in answer to Sir A. Buchanan's notes of the 27th June and 17th September of this year, respecting the International Art and Industry Exhibition to take place at Dublin in May, that, after communicating with the various ministers, the King's Government is ready and willing to afford aid to the above-named Exhibition in the same manner as that which took place there in the year 1853. They would accordingly not fail to inform the heads of the Commercial Body and of the Royal Academies of Art, of the projected undertaking in order that these may communicate it to the parties interested, and to recommend to the Minister of Finance that he should allow the return, free of duty, of the articles sent to the Exhibition as soon as—

1stly. The Committee in Dublin have appointed one or more agents in Prussia to whom those engaged in Industry or Art can make their offers.

2ndly. An intimation be made what aid will be afforded towards defraying the expenses of the transport to and from the Exhibition.

3rdly. A number of copies (about 300) of the prospectus, and of the decisions of the Committee of the International Exhibition, a copy of which was enclosed in the note of June 27, should be sent for distribution.

The undersigned has the honour to request Mr. William Lowther to bring the above to the knowledge of his Government, and in return to inform him of their answer.

(Signed) THILE.

## SECTION I.—MINING, QUARRYING, METALLURGICAL OPERATIONS, AND MINERAL PRODUCTS.

- 1 MINING CO. SICILIA & COUNT OF LANDSBERG VELEN, *Alten Hunden, an der Lenne, Westphalia*.—Iron pyrites.  
 2 BOERNER, MARTIN, *Siegen, Westphalia*.—Iron, copper, and lead ores, &c.  
 3 DURKER, BARON VON, *Brusthausen, near Bochum, Westphalia*.—Geognostical outlines and profiles.  
 4 MEUER, W. *Cologne, R. P.*—Mineral products, iron.  
 5 DINNENDAHL, R. W. *Huttop, near Steele, R. P.*—Centrifugal mine ventilator, for moving by hand.  
 6 D'ABLAIR, J. TROBKEG, & DE WILDT, *Hermannshütte, Newried, R. P.*—Minerals; iron.  
 7 ROCHOLL BROTHERS, *Remscheid, R. P.*—Minerals, manganese; crystals.

8 HILF, MAY, & Co. *Limburg, Nassau*.—Minerals; manganese and iron.

9 DRESLER, J. H. *Siegen, Westphalia*.—Ring of rolled iron wire.

11 BOCHUMER IRON FOUNDRIES, *Bochum, Westphalia*.—Mine ventilator, for moving by hand, system Rittinger.

12 GOVERNMENT BOARD OF MINES, *Bonn, R. P.*—Geognostical atlas of the Prussian State, by Herr von Dechen; map of the coal district of Saarbrücken.

13 GOVERNMENT BOARD OF MINES, *Dortmund, Westphalia*, and SOCIETY FOR THE PROMOTION OF MINING INTERESTS.—Geognostical maps of the mining district of Westphalia, and illustrative specimens of minerals; photographs of machines for collieries; a new safety lamp; elevations of the coal mines, Hibernia and Shamrock.

14 GOVERNMENT BOARD OF MINES, *Halle, Prussian Saxony*.—Geognostic maps and elevations of the provinces Saxony and Brandenburg.

15 GOVERNMENT BOARD OF MINES, *Breslau*.—Geognostic maps and elevations of the province Silesia.

## SECTION II.—CHEMICAL AND PHARMACEUTICAL PROCESSES, AND PRODUCTS GENERALLY.

16 SCHUCHARDT, TH. *Muskau, Silesia*.—Metallic and chemical preparations used in the glass and china manufactures.

17 FUNCKE, EMIL, *Andernach, R. P.*—Soap and perfumeries.

18 MORAN, A. & Co. *Cologne, R. P.*—Hair water; Eau de Cologne; philocome.

19 CUNTZE, E. *Cologne, R. P.*—Oil for watches.

20 REMME AND FRIEDMAN, *23 Alexander st. Berlin*.—Ethereal oils, &c.

21 CUNTZE, H. WIDOW, *Aachen, R. P.*—Oil for watches.

22 FARINA, J. M. WIDOW, *opposite the Altmarkt, Cologne, R. P.*—Eau de Cologne.

23 MARTIN, MARIE CLEMENTINE, *Klosterfrau, Cologne, R. P.*—Eau de Cologne.

24 FARINA, J. M. *opposite the Josephsplatz, Cologne, R. P.*—Eau de Cologne.

## SECTION III.—SUBSTANCES USED AS FOOD.

25 JODOCUS, ROBERTZ, *Cologne, R. P.*—Liqueurs.

26 FALK, A. *Berlin*.—Liqueurs, and old sherry punch extract.

27 BAUME, P. *Dahlen, near Wickrath*.—Liqueurs.

28 FLATAU, J. P. *18 Leipziger str. Berlin*.—Hops grown in Pomerania.

29 PIEPER ET CO. W. L., *Elberfeld, R. P.*—Liqueurs.

30 HEIDEN, R. *Cöthen, Anhalt*.—Chocolate, &c.

31 ENGELHARDT, F. *Russelheim, near Mayence, Hesse*.—Chicory powder, &c.

32 UMBECK & Co. *Credel, R. P.*—Liqueurs.

33 UNDERBERG-ALBRECHT, H. *Rheinberg, R. P.*—Liqueurs and bitters.

34 DRY, A. & Co. *Coblentz, R. P.*—Sparkling Rhine and Moselle wines.

35 KEMPF BROTHERS, *Neustadt, Hardt, Bavaria*.—Sparkling wines.

36 GREVE-STERNBERG, Ph. *Bohn, R. P.*—Liqueurs.

37 BARKATS, G. A. *46 Königs st. Berlin*.—Hungarian wines.

38 HUESGEN, W. & A. *Traben, near Trarbach-on-the-Moselle*.—Wines.

39 AUERBACH, H. *Gotha*.—Preserved meat; Salam's sausage, &c.

40 STETTIN STEAM MILLS CO.—Wheat; flour.

41 ALBERT BECHSTEDT, *Niedertakstein, Nassau*.—Machine-made gingerbread; vermicelli.

42 CASSIRER & Co. M. *Schönentochlowitz, Silesia*.—Liqueurs.

43 BAUTE, F. *Camen, Westphalia*.—Hams and liqueurs.

## SECTION IV.—VEGETABLE AND ANIMAL SUBSTANCES USED IN MANUFACTURE, &amp;c.

43A KÖTHER, C. A. *Cassel, Hesse*.—Wood pulp for making paper.—(See Jury Report, p. 173.)

## SECTION V.—MACHINES FOR DIRECT USE, RAILWAY AND NAVAL MECHANISM, &amp;c.

44 HOERDER MINING AND SMELTING COMPANY, *Hörde, Westphalia*.—Railway wheels and tires; steel plate of great dimension, 35 feet long.—(*Machinery Court*, No. 854.)

45 PLASTIC CHARCOAL MANUFACTORY, 15 *Engel Ufer, Berlin*.—Patent water filters.

46 SCHARFF, B. *Brieg, Silesia*.—Carriage lace.

## SECTION VIII.—MILITARY ENGINEERING, ORDNANCE, &amp;c.

47 HÖRSTER, J. P. *Barmen, R. P.*—Percussion caps.

## SECTION IX.—AGRICULTURAL AND HORTICULTURAL MACHINES AND IMPLEMENTS.

48 BRUNINGHAUS BROTHERS & Co. *Werdohl, Westphalia*.—Steel in bars, agricultural implements, &c.

## SECTION X.—PHOTOGRAPHIC APPARATUS; SURGICAL INSTRUMENTS; MACHINERY IN GENERAL.

49 LIEBEGANG, E. *Elberfeld*.—Photographic apparatus.

50 GOLDSCHMIDT, S. 20 *Dorothea st. Berlin*.—Surgical and orthopedic instruments.

51 UHLHORN, D. *Grevenbroich, near Düsseldorf, R. P.*—Cards for weaving.—(*In Machinery Court*, No. 858.)

52 DOMIER & HAUFF, *Hanover and London*.—Alto-scope, for enlarging photographs, système Ponté.

## SECTION XI.—COTTON.

53 LAURENBERG, C. *Barmen, R. P.*—Turkish red cotton yarn.

54 MARTIN & KUHLES, *Rheydt, R. P.*—Cotton fabrics, lama linen.

55 BORNHOLD, W. *Gladbach, R. P.*—Cotton and woollen canvas.

56 KNABE, E. B. *Plauen*.—Window curtains, mulls, and gauzes.

57 DOMIER & HAUFF, *Hanover and London*.—Tape trimmings and flouncing.

## SECTION XII.—WOOLLEN AND WORSTED.

100 LOCHNER, T. FR. *Aachen, R. P.*—Tricots and cloths.

101 ROY & BODENSTADT, *Berlin*.—Woollen knitted and fancy goods.

## SECTION XIII.—SILK AND VELVET.

58 KLENNE & Co., *Crefeld, R. P.*—Velvet ribbons; trimmings of velvet; galloons; velvet laces, &c.

59 DIERGARDT, F. *Viern, R. P.*—Velvet, ribbons.

## SECTION XIV.—MANUFACTURES FROM FLAX.

58 STOLTENBURG, E. *Stralsund, Prussia*.—Tab cloths, &c.

## SECTION XV.—MIXED FABRICS, &amp;c.

59 MORITZ, A. *Nordhausen, Saxony*.—Mixed textile goods.

## SECTION XVI.—LEATHER, &amp;c.

60 OTTKE, A. *Christburg, Prussia*.—Kid and calf leather.

61 SPITTA & SONS, AUG. *Brandenburg on the Havel, Prussia*.—Leather fabrics; horse leather.

## SECTION XVII.—PAPER AND STATIONERY, PRINTING AND BOOKBINDING.

62 LAMBERTS, W. 63 LAMBERTS, J. H. *Gladbach, R. P.*—Account books.

64 NATHANSON, W. *Hamburg*.—Samples of stamped note paper and astronomical diagrams.

66 CRAMER, C. A. *Cologne, R. P.*—Architectural ornaments in plaster of Paris, and photographs of ornamental castings.

67 SCHWEITZER, SOHNE, *Odenkirchen, R. P.*—Pasteboard.

68 SCHÜTT & LEENDERTZ, *Rheydt, R. P.*—Samples of glazed papers, gelatine papers, and decorated and fancy papers.

69 MEYER, H. C. JUN. *Hamburg*.—Album and writing case, bound in plates of hard vulcanized India-rubber.—(See Manufacturer's description, No. 96.)

70 MATZ & Co. *Berlin*.—Photographic albums.

71 BAEDER, T. *Essen, R. P.*—Work on birds' eggs, with plates in chromo-lithography.

## SECTION XVIII.—WOVEN, SPUN, FELTED AND LAID FABRICS, WHEN SHOWN AS SPECIMENS OF PRINTING OR DYEING.

72 WOLFF, SCHLAFHORST, & BRUEL, *Gladbach, R. P.*—Woven cotton stuffs, llamas and beavers, dyed and printed.

73 RITTERHAUS, J. P. *Bilk, near Düsseldorf, R. P.*—Turkey red and rose-coloured cotton yarns.

74 BUCKHACKER, T. & SON, *Huckenswagen, R. P.*—Dyed woollen yarns for cloth weaving.

## SECTION XIX.—TAPESTRY, CARPETS, FLOOR CLOTHS, EMBROIDERY, &amp;c.

75 WIDEMANN, G. *Gladbach, R. P.*—Samples of ecclesiastical linen vestments, in Mediaeval style, for the use of the Roman Catholic Church.

104 GEVERS & SCHMIDT, *Schmeideberg, Silesia*.—Turkish carpets.

105 HIRTTEL, T. A. *Liepzig*.—Embroideries in woollen and silk.

## SECTION XXII.—IRON AND GENERAL HARDWARE.

76 KRUPP, FRIED, in *Essen, R. P.*—Cast steel cannons; cast steel railway wheels and axles.—(*In Machinery Court*, No. 856. Described page 197.)

77 STOBWANSER & Co. C. H., *Berlin*.—Lamps for colza and hydro-carbon oils; bronze and iron castings; japanned iron wares; tea trays of German silver; brass and japanned metal; chandeliers.

78 LENNE ROHR MINING AND FOUNDRY Co. *Meggen, Altenhundem-on-the-Ruhr, Prussia*.—Rough and finished iron.

79 BOCHUM MINING AND CAST STEEL MANUFACTURING Co. *Bochum, near Westphalia*.—Cast steel bells.

80 SCHULTEN, FRED, *Duisberg, R. P.*—Castings in copper.

81 SCHLENTER & Co. J. in *Weissersüde, near Aich-Chupele*.—Cloth-shearing machines with cast steel spiral knives.

106 COUNT OF STOLLBERG WEHNIGBODE'S FOUNDRY, *Ilsebury*.—Bronzed iron castings.

## SECTION XXIV.—GLASS.

82 OIDTMANN, DR. H. *Linnich, near Linden, R. P.*—Stained glass windows, prepared by a lithographic process.

## SECTION XXV.—CERAMIC MANUFACTURE, CHINA, PORCELAIN, EARTHENWARE, &amp;c.

83 BOLZAU, *Leigo, in Lippe Detmold*.—Meerschaum pipes.

84 SPANGENBERG, G. *Göttingen, near Hanover*.—Paintings on porcelain.

## SECTION XXVI.—DECORATION, FURNITURE, AND UPHOLSTERY.

85 HIERONIMUS, W. *Cologne, R. P.*—Gilt mouldings and cornices.

86 STOLLWERK BROTHERS (HUDSON'S PATENT AGENCY), *Cologne, R. P.*—Mechanical desks.

87 ERNER, J. *Cologne, R. P.*—Oak cabinet, richly carved in Mediæval style.

88 RAMPENDAHN, H. C. 13 *Alster Arcade, Hamburg.*—Furniture in skin and horns of animals of the chase.

89 EUL, N. J.'s SON.—Cornices, mouldings, and ornaments of papier maché.

90 DOBBELMANN, J. *Deutz, near Cologne, R. P.*—Gilt mouldings and cornices.

## SECTION XXVII.—MANUFACTURES IN MINERAL SUBSTANCES.

91 BROESSEL, F. *Neustadt, near Magdeburg, Prussia.*—Roofing felt prepared with cement.

92 CARSTANJEN, JULIUS, *Duisburg, R. P.*—Asphalt roofing.

93 SADEE & POENSGEN, *Düsseldorf.*—Cement, and articles manufactured therefrom.

## SECTION XXVIII.—MANUFACTURES FROM ANIMAL AND VEGETABLE SUBSTANCES.

94 FRETWELL, JOHN, *Lipstadt, Prussia, and 24, Mark lane, London.*—Jewellery and pipes made from hard vulcanized india rubber.

A very large trade in this vulcanite jewellery is now carried on, especially in pressed and carved brooches, neck-chains, "chainé Benoiton," &c. Since the Dublin Exhibition, Mr. Fretwell has undertaken large contracts for various firms for manufacturing from this

material covers for bibles, prayer books, albums, buttons, mouldings for jewellery and ornamenting furniture, knife handles, &c. (See further description in the exhibits of Mr. H. C. Meyer, Jun., No. 96 below, for whom Mr. Fretwell is the London Agent.)

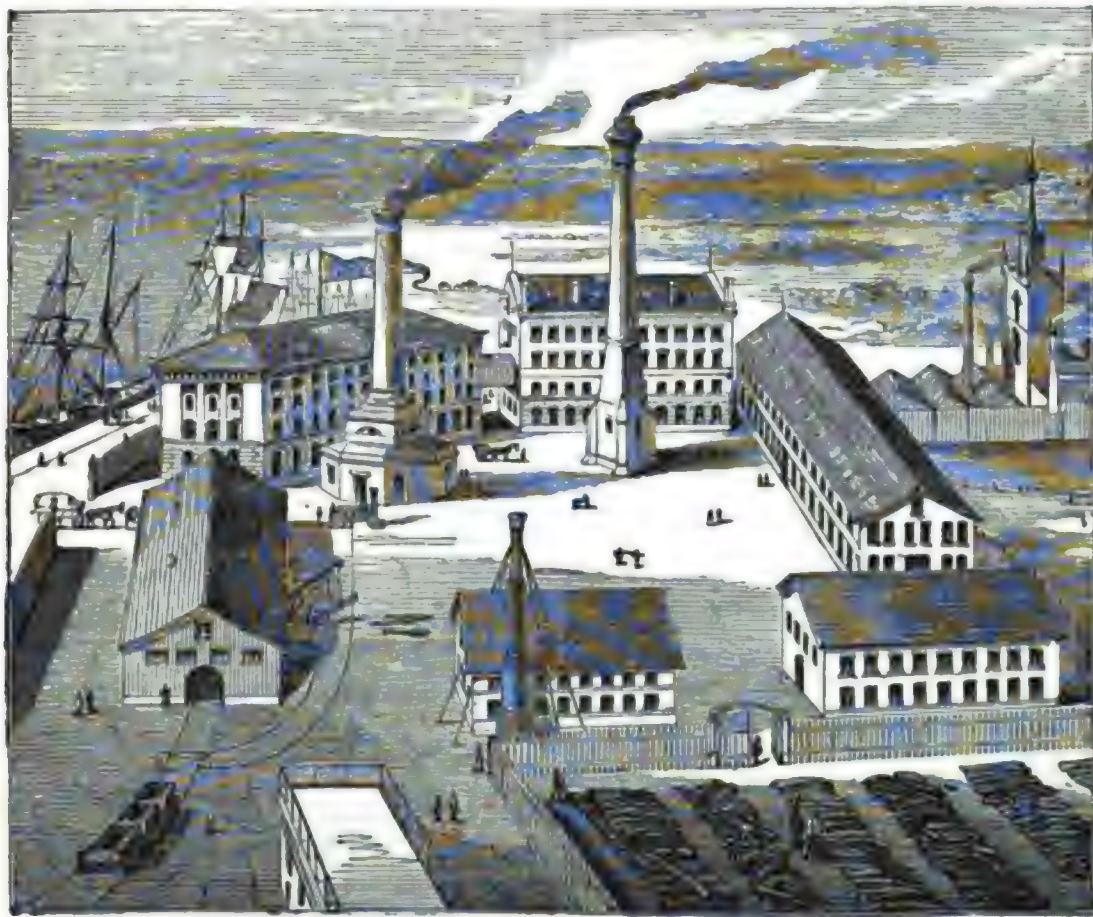
95 HERBST, A. *Bonn, R. P.*—Wicker chairs.

96 MEYER, H. C. JUN. *Hamburg.*—Walking canes; sword canes; India rubber telegraphic insulators; India rubber comb plates; statuary group cast in India rubber; canes and cane handles of India rubber, split rattans, whalebone, &c.

In consequence of the permission granted in the present Exhibition of affixing prices, Mr. Meyer had not any articles specially manufactured, nor bestowed more than ordinary care on their finish, but took those shown indiscriminately from his extensive stock, precisely as if they were offered to an ordinary purchaser. The appended woodcut will convey an idea of the extent of his works, which are generally known and held in estimation on the Continent.

The old-established character of his house, the great extent of his business relations, his direct connexion with the producing countries, and his agencies in all the great markets, give him facilities for extending his business; and by large and quick returns at the same time benefitting his customers by the extent of his purchases and stock. Of the principal articles dealt in, Mr. Meyer thus speaks in his circulars issued:—

"Whalebone, the supply of which has long been declining, owing to the withdrawal of so many British and American vessels from the whale fisheries. This article is less influenced by the rate of wages to the operative than by the first cost of the raw material and the skill required in the manufacture. My connexions in America are such as to secure purchases at the lowest prices. I have also, in the course of the last thirty



Works of H. C. Meyer, Jun., Hamburg

years, by the exclusive and constant attention of a set of skilled workmen, aided by improved machines, brought the manufacture to such a degree of excellence as to combine the most exquisite finish with great cheapness. I supply this article in all its sizes and qualities for busks, staybone, umbrella and parasol ribs, ramrods, walking sticks, hoop-bone, &c.

**"Rattans.**—These long pliant stems or canes, so well known in commerce, would hardly be thought to belong to the Palm family. The imports on the Continent, from the East, reach 600,000 bundles or more annually, of 100 each. Into the United Kingdom about sixteen or eighteen millions of these canes are imported, a large portion direct from the Continent, brought in by the Dutch Trading Company and private merchants.

**"The uses of rattan** are very numerous, and daily extending. I send tons of it split, to all parts of the world for plaiting into chair seats and couches, carriage bodies, baskets, mats, bonnets, &c. They are also used for hoops for dresses by females, for canes, and other purposes. They are sold either in the natural yellow or stained black. Since whalebone has risen so much in price, it has been in a great measure superseded by pressed and stained rattan, with turned points, for umbrella ribs. It is preferred to any other material by the French umbrella makers.

**"Walking Canes and Whips.**—The manufacture of canes forms the groundwork of my business, and ever since 1818, when I founded my establishment in this article, I have made it my constant study to maintain the honourable and well-established character which I have obtained in this department.

**"Last year my sales** exceeded those of any former year by 240,000 dozen, or nearly three millions of canes, and I now have to enlarge my factory very considerably.

**"My factory is,** I believe, the only one in the world where the power of steam machinery and the resources of modern mechanical appliances, and chemical science, are specially applied to the manufacture of walking canes. All that is usually done in other places by hand labour, by the use of rasps, files, planes, &c., is done in Hamburg by machinery, mostly invented and established by myself or my subordinates, and much of which is peculiar to this factory, and not to be found elsewhere. The canes are also distinguished by their superior finish, for while the English ivory mounted cane is merely glued into a large hole bored in the handle, in the Hamburg factory the parts are fastened together by a steel screw, ensuring much greater strength, finish, and durability.

**"While candidly acknowledging** the taste, elegance, perfect finish, and artistic skill of the French, and the solid and appropriate manufacture of the English, I am convinced by the steadily increasing exportation of my manufactures to those countries (not alone for home consumption but also for foreign markets) that I am able to compete with these powerful rivals, especially in good middling sorts at moderate prices. Amongst those dealt in most extensively are Malacca and Manilla canes, palm-ribs, ground rattans, supplejacks, bamboos, whangbees, jambees, tonkins, partridge canes, whalebone and ebonite canes, in great variety, best quality and lowest price for cane and umbrella manufacturers.

**"Wood.**—My business in foreign and fancy woods is quite separate from my manufacturing establishment. It is difficult, if not impossible, to exhibit samples of exotic woods and veneering, and fix their price, since each new block or veneer is different in some way or other from the rest. Traders and consumers in this line know that nothing but a personal examination, or an order by way of trial, will suffice to form an opinion. For the convenience of those who are disposed to favour me with trial orders I am prepared to supply them with cases containing about 1,200 square feet of veneers of different selected kinds (of which I would particularly recommend rosewood and Hungarian ash to English customers) at about £15 each. The superior quality of my machines, and the careful selection of the wood, of which

I have about 150 varieties always in stock, enable me to offer the greatest advantages to customers.

**"Vulcanite.**—Since the process of vulcanizing India rubber was discovered, this material has been applied, both in a soft and hard state, to innumerable technical purposes. The hard vulcanized India rubber possesses, in combination, many valuable qualities which are not found combined in any other material.

**"Flexible and tough as whalebone or horn,** it is impervious to the chemical action of acids and alkalies, and is, therefore, water and weather proof. Like bronze it may be cast into the most varied plastic forms, and is capable of the highest finish.

**"While it is obedient as ivory to the carver's tool,** it is less liable to split in working than that material. It is capable of receiving almost any colour; and its non-conducting powers qualify it in the highest degree for the purpose of telegraphic insulation.

**"Telegraphic insulators of hard rubber** have been manufactured by me for various governments and telegraphic companies in Germany, Denmark, and Russia, and have proved themselves admirably adapted to their purpose, resisting most effectively the influence of weather, rain, snow, frost, heat, and lightning. The defects which make the use of the common insulators of glass, porcelain, or stoneware, so expensive, are remedied by the use of pure hard vulcanized India rubber, and I am convinced that there is a wide field open for the employment of this material for electrical purposes.

**"For the manufacture of combs** it has already to a great degree superseded all other substances, as ivory, horn, wood, and metal. I need only refer to the universally known and esteemed productions of the Hamburg India Rubber Comb Company, in the kingdom of Hanover, which was founded by me, and which, like some other India rubber comb factories, obtains the whole of its raw material from me.

**"The India rubber brushes** exhibited by me are far cleaner in their use than those with backs of horn, wood, or ivory, as they can be washed without injury in warm water, while their price is hardly more than that of the far less durable best quality wood-back brushes.

**"India rubber cane-handles and walking sticks,** and other decorations for sticks will be found in great variety in my department, and serve to give some idea of the admirable plastic qualities of this material. A still more striking instance is afforded by the small statuary group at the top of my show case (representing a Roman shepherd boy and dog) which is cast in one piece, the colour pervading the whole mass; in durability it is hardly inferior to bronze, while the cost, £10, is considerably less.

**"Want of space having prevented me from exhibiting any large figure,** I may refer to the statue of Hermann, the conqueror of Barus, exhibited by me in the London International Exhibition of 1862, which was nine feet high, and was rewarded by a medal.

**"Cleanly as glass,** hard vulcanized India rubber is applicable to a variety of purposes for which glass was formerly used, such as enema and injection syringes, tubes and bottles for chemicals, acids, &c.

**"As a substitute for jet in the manufacture of black jewellery,** it has long been known in England, being equal to this material in lightness, polish, and depth of colour, while in durability, cheapness, and plastic power it is infinitely superior. I have exhibited a few specimens.

**"Its applications are almost innumerable.** Its insensibility to the ordinary changes of temperature adapts it admirably for the construction of mathematical instruments. Bowses for flax mills constructed from this material are far more durable and exact than those of boxwood or gutta percha, and far less liable to injury from the action of warm water.

**"Plates, tubes, and castings for the manufacture of album and bible covers, rulers, snuff boxes, pipe-tubes, fans, crochet-needles, chains, piano keys, veneers for**

cabinet-work, buttons, brooches, walking sticks, pencil-cases, and innumerable other fancy wares, have been and are sold by me in large quantities. The price of the sheets varies from 2s. 3d. to 8s. per lb., according to quality. Quality A at 4s. 1d. per lb., is made of the purest Para rubber, and in facility of working, consistence and polish, exceeds all other kinds manufactured.

"In my show-cases may be seen sheets from 1½ inch up to 1½ inch in thickness, all perfectly vulcanized.

"The fact of my having obtained medals at the London Exhibitions in 1851 and 1862, at Paris in 1855, at Berlin in 1844, and Dublin in 1865, is a sufficient guarantee of the character of my productions and trade.

"All other information respecting my business will be promptly supplied by my agent, Mr. JOHN FRETWELL, Jun., 24, Mark-lane, London."

97 HANOVER GUM KAMM COMPANY.—India rubber combs.

## OTHER STATES OF THE ZOLLVEREIN.

### SECTION II.—CHEMICAL AND PHARMACEUTICAL PROCESSES, AND PRODUCTS GENERALLY.

107 ECKERT, W. & Co. *Frankfort-on-the-Maine*.—Cigars impregnated with iodine.

### SECTION III.—SUBSTANCES USED AS FOOD.

108 EHRENBACHER, T. F. & Co. *Leeds and Nuremberg*.—Bavarian hops and teasels.—(*Bavaria*).

### SECTION V.—MACHINERY.

859B FUESS, KARL, & Co. *Hamburg*.—Patent Bituminized paper pipes.—(*Machinery Court*).

### SECTION X.—MUSICAL, HOROLOGICAL, AND SURGICAL INSTRUMENTS; MACHINERY IN GENERAL.

109 DILGER, O. *Tryberg (Black Forest)*.—Fancy clocks.—(*Baden*).

110 WEHLE, F. X. *Furtwangen (Black Forest)*.—Musical instrument; solo melodion to be placed under a pianoforte.—(*Baden*).

111 WEHLE, E. *Furtwangen (Black Forest)*.—Trumpet clock, grand musical work, performing different pieces.—(*Baden*).

112 HASSELWANDER, J. 1 *term Isarther, Munich*.—Musical instruments; a manual for guitar-players.—(*Bavaria*).

113 HENCKEL & SECK, *Munich*.—A husking machine to take off the outer skin of grain; and specimens of husked grains.—(*Bavaria*).

114 SCHWENNINGER (TOWN OF) CLOCK AND WATCH MANUFACTORY. — Burk's (inventor) portable control watch, with control bulletins and book.—(*Wurtemberg*).

### SECTION XVI.—LEATHER, &c.

115 LINSE & Co. *Craillheim*.—Polished leather for carriages; polished horse leather.

### SECTION XVII.—PAPER AND STATIONERY, PRINTING AND BOOKBINDING.

116 HOLTEMANN, G. *Carlsruhe*.—Tracing paper, and designs.—(*Baden*).

117 FABER, A. W. *Stein, near Nuremberg*.—Pencils and slates (new invention).—(*Bavaria*).

118 POSTER, F. *Regensburg*.—Miscellaneous Romanesque, with chromo title (folio); same (octavo); Epistolare (folio); Breviarium (quarto).—(*Bavaria*).

119 ESCHENBACH, K., FIRM OF EBERHARD & Co. *Munich*.—Richly carved writing table; albums, &c.—(*Bavaria*).

120 LESER, S. *Frankfort-on-the-Maine*.—Fancy leather bags, escrivoires, albums, cigar cases, portemonnaies, purses.

### SECTION XXII.—IRON AND GENERAL HARDWARE.

121 SEEBAS & Co. A. R., *Offenbach-on-the-Maine*.—Fancy articles of bronzed iron; letter weights, crucifixes, candlesticks, light screens, escrivoires, glasses, thermometers, watch-stands, copying presses, night-clocks, &c.—(*Great Darmstadt*).

### SECTION XXIII.—WORKING IN PRECIOUS METALS AND THEIR IMITATIONS; JEWELLERY AND ARTICLES OF VERTU OR LUXURY NOT INCLUDED IN OTHER CLASSES.

122 WUNSCH, J. B. *Nuremberg*.—Gold and silver embroideries for ecclesiastical purposes, &c.—(*Bavaria*).

123 SCHREIBMAYER, J. G. *Munich*.—Manufacturer—Chandeliers of bronzed iron; ornamental articles for theatres.—(*Bavaria*).

### SECTION XXIV.—GLASS.

125 BILLER, K. 2 *Aussere Birkenau, Munich*.—Stained glass; a Madonna after Pompejo Battani; a Christ's head after Pompejo Battani; crowning of Christ, after Quercino.—(*Bavaria*).

### SECTION XXV.—PORCELAIN, &c.

126 BUCKER, H. *Saxony*.—Paintings on porcelain, from originals in the Dresden gallery.

127 MEYER, M. *Saxony*.—Paintings on porcelain, from paintings by Van der Werf, Mieris, and Liotard, in the Dresden Gallery.

128 WUSTLICK, OTTO, *Munich*.—Pictures on porcelain: "The Trumpeter," after Therberg; "The Concert," after Netcher.

### SECTION XXVI.—DECORATION, FURNITURE.

129 TRIMBORN, C. *Munich*.—Colossal stag's head with horns; game and deer's heads; animals, copied after nature, in papier maché.—(*Bavaria*).

130 MAYER & Co. Artistic Establishment, *Munich*.—Statue of artificial stone, "Christ Teaching;" richly gilded altar carved in oak wood, representing the "Coronation of the Virgin" and "Adoration of the Three Kings."—(*Bavaria*).

### SECTION XXVII.—MANUFACTURES IN MINERAL SUBSTANCES, USED FOR BUILDING OR DECORATION, &c.

131 THORSCHMIDT & Co. C. L., *Pirna-on-the-Elbe*.—Fancy articles made of "Siderslith" (artificial stone).—(*Saxony*).

## CLASS F.—FINE ARTS.

### THE SCULPTURE COURT.

THE English public, until very recently, have shown but a careless patronage of Sculpture, which is more dependant for its support on persons of a highly cultivated taste and refined mind than its sister art, Painting. There is no glare of colour and show in sculpture, no sketchy shadowings, to aggrandize the artist's efforts. Generally sculpture is thought to be cold, and in England not capable of exciting that animation which its sister art, painting, calls forth. It has never fully developed itself but in the most polished ages of the most refined people. The Greeks crowned it with honour, and among its followers are to be found the greatest of her philosophers, statesmen, and poets. The history of that wonderful people has been written in its sculpture.

Until very recently in this country marble sculpture has been looked upon as an art only of a grave and monumental character, and rather inspiring feelings of melancholy interest than an art which could be brought into all the pleasing phase of domestic ornamentation, and as freely used in our homes as the coloured canvas that cheers the walls of an English mansion. There is a grandeur and largeness of expression, of pathos and feeling, in sculpture which can never be conveyed by painting. Sculpture presents to the eye, in the most perfect form, all that is majestic, truthful, tender, and lovely; and amid the wreck of the arts of ancient nations it comes to us fresh and full of grace, and inspires the sister arts with the purest and most lofty sentiments.

The Sculpture Gallery struck the observer as being the most unique and original collection in the whole building, whether as regards the number, variety, and excellence of the objects, the suitable hall in which they were exhibited, or the admirable manner in which they were arranged. For the first time in the United Kingdom the dignity of Sculpture was acknowledged, and a suitable chamber prepared for its reception. In all the Exhibitions that had preceded this, even in those devoted solely to the Arts, sculpture was treated as a mere Cinderella by her sisters Painting and Architecture, and either kept in a cellar or thrust into some obscure corner as a poor relation whom one must needs admit but was ashamed to own. Here, however, was a stately hall, supported by noble columns, glowing with tessellated pavement, decorated *à la Pompeii* with the sombre but suitable colours of crimson, yellow, and black; and in this hall, in goodly array, stood 283 modern statues and imaginative works in the purest marble; in some instances unsurpassed, in most fully up to the order or standard of modern development. In a work like the present it would, of course, be impossible to enter into any lengthened criticism or even description of such a numerous collection. Hence the reader must be content with a slight notice of a few of those brilliant works of genius

[The name of the proprietor, when other than the artist, is appended in *italics*. The prices of works for sale are affixed when known. The Art Superintendent, HENRY E. DOYLE, Esq., or PHILIP W. KENNEDY, Esq., Superintendent of Sales, afforded all necessary information to those persons desiring to purchase. Fifteen per cent of the price had to be deposited; and the Executive Committee did not recognize any sales unless made through those gentlemen. No work could be delivered to the purchaser until after the close of the Exhibition. Works for sale were distinguished by bearing numbers on red cards. It was found unavoidable to place all works in sculpture in one continuous list, irrespective of nationality; but to the name of the artist was attached the name of the school or of the country to which he belonged.]

which for six months dazzled and delighted the eyes of thousands.

The sculpture placed in the pillared hall, opposite the principal entrance from Earlsfort-terrace, was the first to arrest the attention of the visitor. The general arrangement of the statues and pictures was intrusted to Mr. Henry Doyle, who performed a similar duty so creditably in the Exhibition of 1862. Lord Southwell, Mr. Joseph Kirk, Mr. Kyle, and Mr. Mulvany rendered valuable assistance, and were indefatigable in their exertions. In the groups of statues were many works of exquisite beauty, but there were two which at once arrested attention and extorted admiration—"The Sleeping Faun and Satyr," by Miss H. Hosmer, and Mr. Story's "Judith." It is a curious fact that amid all the statues in this Court contributed by the natives of lands where the fine arts were naturalized thousands of years ago, the two finest statues should be the productions of American artists. But they have both received their inspiration under Italian skies, in presence of the great models of ancient Greece and Rome. Hawthorne's description, in the "Transformation," of the Faun of Praxiteles, has been quoted as in a great measure applicable to the masterpiece of Miss Hosmer. Mr. Hawthorne writes:—

"The Faun is the marble image of a young man, having his right arm on the trunk or stump of a tree; one hand hangs carelessly by his side; in the other he holds the fragment of a pipe or some such sylvan instrument of music. His only garment—a lion's skin, with the claws upon his shoulder—falls half way down his back, leaving the limbs and entire front of the figure nude. The form thus displayed is marvellously graceful, and a fuller and more rounded outline, more fleshy and more of heroic muscle than the old sculptors were wont to add to their types of masculine beauty. The character of the face corresponds with the figure; it is most agreeable in outline and feature, but rounded and somewhat voluptuously developed, especially about the throat and chin; the nose is almost straight, but very slightly curved inward, thereby acquiring an indescribable charm of geniality and humour. The mouth, with its full yet delicate lips, seems so nearly to smile outright, that it calls forth a responsive smile. The whole statue conveys the idea of an amiable and sensual creature, easy, mirthful, apt for jollity, yet not incapable of being touched by pathos." Miss Hosmer's Faun is in a reclining position, and is represented just at the moment when he is dropping asleep, his left arm falls carelessly over the stump of a tree, against the lower part of which he is leaning; the head, thrown back, rests on his left shoulder; the legs are crossed, and the right hand lies upon the calf of the left leg, from which it appears to be gradually slipping, as the muscles become more and more relaxed under the influence of sleep. His sylvan pipe has fallen from his grasp, and this, with a bunch of grapes, an oaken staff, and a lizard crawling round the stump of the tree, form appropriate accessories to the figure of the sportive and frisky Faun. Beside the Faun is seated a baby satyr, full of fun and mischief, who is busily intent on tying into a knot the tail attached to the lion's skin, that constitutes the Faun's only covering. This is a capital little figure, full of life, truth, and vigour.

The other statues, most admirable for their power of



THE English public, but a careless patron dependant for its cultivated taste and refining. There is no sketchy shadowing. Generally sculpture of land not capable of sister art, painting, developed itself but in refined people. The and among its followers her philosophers, that wonderful people.

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The Sculpture Gallery the most unique and building, whether an excellence of the they were exhibited which they were a United Kingdom to be ledged, and a suitable. In all the Exhibition devoted solely to the Cinderella by her sister either kept in a cellar as a poor relation ashamed to own. supported by noble pavement, decorated with suitable colours of this hall, in goodly imaginative works of stances unsurpassed of modern development would, of course, be met criticism or collection. Hence slight notice of a few

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THE SCULPTURE COURT, CENTRAL



T. CENTRAL HALL, NORTH-WEST SIDE, DUBLIN INTERNATIONAL EXHIBITION.

expressions and their delicate chiselling, were the "Camilla," by Pandiani, of Milan; "The Woman taken in Adultery" (24), by Bernasconi, of the same city; Magni's "Swinging Girl" (28), and Mr. Kirk's statue of "Sappho" (30). The most striking work in the collection was the colossal statue of Pisa IX. (185) writing the rescript establishing the dogma of the immaculate conception.

Miss Hosmer's statue we have already alluded to. This, in purity of outline, breadth of detail, power of conception, and finish of execution, equals if not surpasses the finest antique sculpture in existence. Dublin retains this beautiful work of art, it having passed into the magnificent collection of Mr. B. L. Guinness, one of the city members, who purchased it from the artist for the sum of one thousand pounds. Next in merit we may place the statue of "Modesty" (14), by Quintilio Corbellini, of Milan; the shrinking attitude, the modest air, the pure intention, the perfect simplicity, are alike unrivalled in this exquisite work of genius. This, with the "Judith" (37), by Story, of Rome, a grand and fine conception, also found its way into Mr. Guinness's collection. We may next particularize the statue of "Courage" (10), by Giovanni Strazza, of Milan, the busts of "Joy" (13) and "Modesty" (42), by G. B. Lombardi, of Rome; a beautiful statuette, "The Letter" (41), by Tassardini, of Milan, which we have illustrated, as well as a charming statuette of "Penelope" (84), by Brugger, of Munich. We pass next to a plaster group of the "Virgin and Child" (238), by Montagny, of Paris; "The Kiss of Judas" (139), by Jacometti, of Rome; the "Mater Salvatoris," by Spertini; "Pieta" (301), by Farrell, of Dublin; "She Gave and Kid" (12), by Lombardi, of Rome, wonderful for its execution; "The Difficult Lesson" (33), by Angelo Biella; and the "Gillie and Hound" (34), by Munro, of London; all these deserve a more lengthened and elaborate criticism than space will permit us to give them; the same may be said of numerous others, which we can only enumerate.

The works of Signor Magni, as usual, attracted general admiration. His "Reading Girl," so well known, was here; and, in addition, two charming new pieces, "The Swinging Girl" (28) and "The Sketching Girl" (38) (purchased by the Rev. Mr. Foster, of Cambridge). The famous statue of "David Throwing the Stone" (74); "The Young Soldier" (37a) (purchased by Mr. Wardell, of Dublin); and though last, not least, that delight of mothers and children, "Hush, Don't Wake my Baby" (18). Deserving of more than passing notice was the beautiful æsthetic statue of "Beatrice Portinari" (11), by Fabi, of Rome. The "Michael Angelo when a Child Sculpturing the Head of a Faun" by Zocchi, of Florence, which also found a resting place in Dublin, having been purchased by Mr. Wardell. "Saul under the Influence of the Evil Eye," by Story, of Rome; numerous works by Benzoni, of Rome; Frequin and Geefs, of Belgium; Lazzarini, of Lucca; Kiphon, of Greece; Carl Voss, of Rome; Pierotte, of Milan; Galli, of Milan; Luccardi, of Rome; Albertini, of Turin; Rauch, of Berlin; Rinaldi, of Rome; Corti, Rigamonti, and Argenti, of Milan; Vela, of Turin, and others. Amongst the English sculptors represented were Foley, Wood, Munro, Adams, Birch, Wyon, Woolner, Thornycroft, Davis, Papworth, Thrupp, Crittenden, and others. Amongst native sculptors were Kirk, who, besides his figure of "Sappho," already alluded to, had a marble figure of a "Child and Shell," purchased by Mr. Pitcairn, of Dundee; a large mediæval monument to the late Lord Massereene, and some marble busts; Mr. T. Farrell, a small figure of the "Madonna" and a "Pieta;" Mr. Cahill, a bust; Miss Morgan, of Cork, two figures; Mr. Powell, several groups in plaster; and there were two beautiful marble figures by the late lamented Mr. Hogan. A beautiful statue of "Eve after the Fall" (53), by Argenti, of Milan, was purchased by Mr. Smith, of Fitzwilliam-square, Dublin; and two fine marble busts (107 and 117), by Müller, of Rome, were bought by Mr.

Mitchell, of Sackville-street. Amongst the lady sculptors who exhibited, besides Miss Hosmer, were Miss Stebbins, who had a fine statue of "The Patriarch Joseph," life size; Miss Foley and Miss Freeman, English ladies, residing in Rome; and Miss Jane Morgan, of Cork, who sent a life size figure of "A Girl Reading," a marble figure of "A Boy and Bird," and some capital marble busts. The admirable statue of "The Woman taken in Adultery" (24), by Bernasconi, of Milan, was also purchased by Wardell, of Dublin. At the entrance of the Sculpture Hall from the building stood two very fine colossal busts, one of "Christopher Columbus," by Della vedova, of Turin (25), and the other of "Galileo," by Giani, of the same city. "A Veiled Cupid" (27), by Rosetti, of Rome, likewise obtained and deserved much admiration; "The Beggars" (40) a group, by Galli, of Milan, was a wonderful instance of what may be called pre-Raphaelism in sculpture, so minute were the details. Two exquisite statuettes, by Voos, of Rome, should not, even in a slight sketch like this, pass unnoticed. "Hebe Pouring Nectar for the Bird of Jove" (46); and "The Lorelei, the Witch of the Rhine" (44). "Nyxia Flying from Pompeii" (93), by Rogers, an American sculptor residing in Rome, was a powerfully-conceived and wonderfully-executed statue. A charming little statuette "A Girl Reading in Bed" (103), by Cocchi, of Milan, was deserving of more than passing notice. The whole collection was considered by competent judges to have been one of the best ever got together of modern sculpture, and the sales were numerous and satisfactory.

The *Illustrated News* remarks:—

"As with the pictures, the various nations who contributed were very disproportionately represented; Italy, for instance, sending more than all other nations put together.

"Commencing our review with the British and American sculptures, we have merely to record the reappearance of such well known works as Mr. Foley's very masterly statue of the Parsee merchant, Mannoockjee Nuserawanjee, and bust of Barry Cornwall (by-the-way, we could have wished to see the busts of our younger sculptor represented more fully in the Great Exhibition of his native city); Black's beautiful female statue, 'The Love Text'; Mrs. Thornycroft's Royal portrait busts; Marshall's 'Ophelia'; G. Adams's bust of the Duke of Wellington; Marshal Wood's 'Daphne'; E. Davis's statue of Wedgwood; and the alto-relievo, by the same sculptor, of 'The Guardian Angel,' exhibited in the London International. By Mr. Davis there is also an alto-relievo of the 'Madonna and Child' (203), which will well bear comparison with the 'Mater Salvatoris.' Munro's 'Joan of Arc' had been seen at the Royal Academy, as also his 'Child Asleep.' There is a plaster model of a statue of Briseis (244), by E. Wyon (the finished work, in marble, has not been exhibited), which has much refinement and grace; Woolner's bust of Combe—exaggerated, as usual, but one of his best works: there is also, by the same, a small sketch for the vigorous and animated, but somewhat stilted and quite unnecessarily ugly and awkwardly-clad bronze statue of Mr. Godley, now in the South Kensington Museum. By Mr. Woolner there is, too, a plaster statue of Moses (246), which will certainly not enhance the sculptor's reputation, though it may increase that notoriety given to him in certain quarters. His 'Moses' is a mean looking old man, whose anger is as contemptible as it is theatrical; his action is cramped and unnatural, and we positively never remember to have seen a figure huddled up in such hideous masses of unmeaning lumpish drapery. The statue is considerably placed in a dark passage; and, in justice to Mr. Woolner, we would add that we believe it to be a work of his studentship. By Major Powell there is a small group of a 'Bull Fight,' a slight but vivid sketch. By the late J. Hogan, the Irish sculptor, there is a statue of 'Eve' (53), starting at first sight of death—i.e., a dead dove—rather mannered and weak in some of the forms; and by J. R. Kirk, another Irish sculptor, a statue

of 'Sappho' (30), somewhat injured in effect by the heaviness of parts. But the finest sculptures in the Exhibition were Miss Hosmer's group, 'Faun and Satyr,' purchased by Mr. Guinness; and the 'Saul' by another famous American sculptor at Rome, Mr. Story. The statue of the gigantic Saul is colossal. The king is represented seated, when 'the evil spirit from God is upon him' (1 Sam. xvi. 23), that spirit exorcised only by David's playing—a service which the jealous Saul afterwards rewarded by seeking his life. The wicked king sits on his throne, looking with dilated eyes and the fierceness of dementia, his brow fearfully corrugated, his whole frame convulsed. With one hand he clutches at, to tear, his beard; with the other he grasps the handle of a weapon at his side; yet the terror of his aspect is dignified by Michael Angellesque largeness and grandeur. Mr. Story's statue of 'Judith' (37), standing, invoking Heaven's assistance, though noble in character and good in action, is not, to our mind, so happy; the Jewish heroine has a modern air, and her expression is somewhat tame.

"On the Belgian sculpture we need not dwell. By C. Fraikin there were a 'Fairy of the Woods' (32); a statuette of 'A Sleeping Venus' (57), and other of this celebrated sculptor's luxurious and rather meretricious female representations. The plaster ascending figure or apotheosis of 'Malibran' (236), by G. Geefs, is a poor affair, the drapery obviously serving as pedestal. A marble group, entitled 'Venus clips Cupid's Wings' (2), by T. H. Geefs, is cleverly executed and pretty. It would make a suitable ornament for a lady's boudoir, but cannot rank high in art. By the characteristic but sensuous French sculptor, Cordier, there is a bust of a negress; by the German sculptor, R. Caner, there are two or three pleasing small groups; and there was a very large bronze casting of a spirited boar-hunt group, modelled by M. Geiss, of Berlin."

In the large and interesting collection of Italian sculpture we have principally to note the excellence of the workmanship, due to the traditional and extensive practice of sculpture among the art-loving Italians, in a country the very backbone, so to speak, of which—meaning, of course, the Apennines—is of the sculptor's raw material. But we shall also find a great deal of power wasted through indefiniteness of aim or upon unsuitable, frequently trivial, subjects, and in tricks of imitation which the nature of the material will never permit to be satisfactory. The most conspicuous sculpture in the Exhibition, the rather tame, too softly wrought, and common-place colossal marble statue of the Pope, by F. Matteini, will partly illustrate what we mean. Reverence for the office of his Holiness may be admitted to account for his being represented in pontifical robes, though they cannot assume any of the beautiful forms of "drapery" in the sculptural sense; but it will not account for the artist lavishing more pains on a lace petticoat than on the kindly and benevolent face of Pius IX.; still less will it excuse the attempt to render in marble the patterns, the very web and woof, of the vestments he wears. To Signor Magni—whose over-rated "Reading Girl," as well as a copy, are here—our remarks will, however, more directly apply; and the example of such an artist may be the more pernicious, because he is undoubtedly a sculptor of ability. What shall we say of a statue of a laughing little girl who has put her doll to bed in a sort of stool cradle, and who, resting this on a Maltese terrier, is to be understood as saying, in the words of the title, "Hush! Don't Wake my Baby" (18). The expression is good, certainly, and we may smile at the innocent conceit; but is so trivial an incident worthy of being laboriously recorded in imperishable marble? Would not a water colour sketch have been a more appropriate medium? Then we have statues in the "picturesque" style (the very application of such a term is, generally speaking, sufficient criticism) of Italian women, called "The Dance" and "Music," both quite unworthy of the sculptor; and—following the success of "The Reading Girl"—"The Drawing Girl," fully as meritorious we must confess; and "The Swing-

ing Girl"—a girl swinging on a scarf slung from the branch of a tree, and pushed by a little child (we must not say "amorino" in so naturalistic a representation)—a subject very skilfully treated, and with some beautiful modelling in the figures, but entailing a conventionality in the accessories out of harmony with the aim at fidelity to nature. For our part, we vastly prefer to associate the sculptor's name with a statue of "David," preparing to sling the stone at Goliath, and which is admirably spirited and natural in attitude and expression. Another distinguished Milanese sculptor in the picturesque style, G. Strazza, sends an ably-executed statue of "Ismael," lying fainting with thirst, but his attenuated condition is unfit for representation as well as unauthorized; and also a statue, "Courage" (10), of a Neapolitan fisher boy stooping to draw the fuse from a bomb about to explode. With all the pains lavished in rendering the joints, muscles, and veins of the seated "Diogenes," by R. La Barbera (Palermo), a shrivelled, naked old man is not a pleasant object for contemplation. Benzoni's marble statue of "Diana" is hackneyed in treatment, and fails to awake interest—which a fine real antique never does. C. Pandiani, of Milan, has a statue of "Camilla" prepared for war, with sword and shield, a lion's skin over her shoulders, as she might have gone forth to assist Turnus against Æneas, and standing, or rather striding, defiant, proud, and beautiful; an effective and spirited figure in the ornamental style. Other works deserving mention in this style are the "Spring," by Vela; "Girl Smelling a Rose," and other examples by G. Fontana, an Italian sculptor (we believe) resident in London. "Modesty," a statue by Q. Corbellini, expresses its sentiments with pleasing delicacy. A word of commendation (with some tacit reservation) is also due to G. Argenti's "Eve After the Fall" sitting in despair; F. Andrei's "Rachel;" C. Corti's "Mazepa," very spirited, a *tour-de-force* in execution; and "Michael Angelo when a Child sculpturing the Head of a Faun, his First Work," by E. Zocchi.

At the Dublin Exhibition of 1853 the following statues, &c., were shown:—

Marble,	-	-	-	191
Plaster,	-	-	-	193
Copper, bronze, and zinc,	-	-	-	68
Stone,	-	-	-	2
Terra cotta,	-	-	-	1

Total, - - - 455

There were 79 exhibitors, besides some few from Belgium, France, and Germany, the number of exhibitors in which were not specified. Seventy-seven of the marbles were busts.

At the Manchester Arts Treasures Exhibition there were 160 pieces of marble sculpture shown.

In 1865, at Dublin, there were exhibited:—

Marble,	-	-	-	237
Plaster and terra cotta,	-	-	-	63
Bronze, copper, and zinc,*	-	-	-	12
Stone,	-	-	-	1

Total, - - - 363

The aggregate value of the Sculpture shown, from the prices affixed, may be taken at £45,000.

## SCULPTURE.

### Central Hall.

1 THE MADONNA—J. Farrell, Dublin.	£350
2 VENUS CLIPS CUPID'S WINGS—Marble. T. H. Geefs, Belgium.	£350
3 SECRET LOVE—Marble. Emil. Wolff, Berlin.	£80
4 BATHER—Marble statue, half size of life. U. Zannoni, Milan.	£80

\* Exclusive of numerous British and French exhibits not enumerated in the Catalogue.

**5 INSTRUCTION**—Marble group. Lazzarini, Lucca. £600  
*M. Casentini.*

**6 CAMILLA**—Marble statue. C. Pandiani, Milan. £300

**7 BEATRICE CENCI** receiving her sentence of death in the Savelli prison. "Her trust is in God alone."—Statue in Marble. Prof. V. Luccardi, Rome. £200

**7A DAVID THROWING THE SLING**—Statue in Marble. P. Magni, Milan. £1,000

**8 BOY ENTERING THE BATH**—Statue in marble. A. Di Giacomo, Rome. £70

**9 BOY AND BIRD**—Marble. C. Fraikin, Belgium. £80

**10 COURAGE**—Statue in Marble. Giovanni Strazza, Milan. £200

**11 BEATRICE PORTINARI**—Statue in marble. F. Fabi-Altini, Rome. £500

"When to the left

I saw Beatrice turned, and on the sun

Gazing as never eagle fixed his ken."—*Cary's Dante.*

The four bas reliefs on the pedestal represent the four epochs of life.

**12 GROUP OF TWO GOATS**—Marble. G. Lombardi, Rome, £320. This group (named somewhat vaguely in the catalogue) was an object of curious interest to most spectators on account chiefly of the elaborate



Group of Two Goats, by G. Lombardi, Rome.

painstaking and the dexterous chiselling (for which Italian sculptors are so remarkable) displayed in the rendering of the hairy coats of the animals. But the group must be credited with higher merit than can attach to merely careful and skilful handling. The underlying forms of the animals are most knowingly and toothfully indicated; and their motions are very spirited and characteristic—the mother rearing herself with the maternal instinct of defending her offspring, and the little kid, unconscious of danger, seeking the source of its natural aliment. At the same time it may well be doubted whether the subject, taken alone, is either worthy of, or suited to, the material. Would not some more facile means or material render all that we have here, or that is worthy of being rendered in such a subject, with one-tenth of the labour? On account of the brittleness of the marble, the sculptor is obliged to resort to the always clumsy expedient of sustaining the goat by a meaningless pedestal of rock under its chest. But, what is more essentially contrary to the principles of true arts is the sense of painful toil and lavished skill—with, after all, an inadequate result—which is conveyed by the attempt to realize in the rigid material of marble, the flow and lightness of hair. The bas-relief on the pedestal of the group is pretty and appropriate enough to the pastoral subject; it consists of Pandean pipes and oaten reed, bird's nest and young, rose and bud, and twining convolvulus.

13 JOY—Marble bust and pedestal. G. B. Lombardi, Rome. £65

14 MODESTY—Marble statue. Q. Corbellini, Milan. £120

15 SLEEPING FAUN AND SATYR—Statue in marble. Miss Harriet Hosmer, Rome. £1,000

Miss Hosmer's group (observes the *Illustrated News*) surpasses everything by its gifted author we have previously seen, and for truthful modelling of the human form, controlled by a fine feeling for grace, derived from study of the antique, there is, we think, nothing in the Exhibition quite equal to it. It need not be said, for it is quite evident in all she does, that this gifted American lady has, with her master at Rome, our own English sculptor, Gibson, and with Flaxman, Thorwaldsen, Canova, and every modern sculptor who has distinguished himself, not only studied nature but also the great masterpieces of antiquity. The original "motif" for the faun is probably traceable to the famous antique, without legs and only one arm (thrown over the head), sleeping in a somewhat similar attitude, known as the Barbarini Faun, and now at Munich. But Miss Hosmer's Faun is a younger member of the satyr class, less coarse in character and less inebriate. It is not a savage, but a comparatively graceful and refined impersonation of sylvan nature; one of the fauns of Arcady, a pupil of Pan, as we see by the Pandean pipes; and a follower of Dionysius, as we infer from the panther skin and the grapes—emblems of the rich fecundity and intoxicating power of nature, and the juice of which has contrived to his deep slumber. The introduction of the infant satyr is a pretty fancy,



Sleeping Faun and Satyr, by Miss Hosmer.





"HUSH! DON'T WAKE MY BABY." BY P. MAGNI, MILAN.





and the little playful half man half goat, is suitably engaged in the mischievous task of fastening the sleeper to his seat by tying together a paw and the tail of his panther's skin. This group proves beyond a doubt the advantage of referring to classical sculpture in plastic representations of the human figure. The Greek sculptor (as pointed out by Sir Charles Bell) had, unquestionably, opportunities of studying the nude such as no modern artist can enjoy. This choice of subject, however, will be objected to by those who would thoughtlessly, in our opinion—deny to the modern sculptor all classical themes. Surely the poetic imagination which pervades, and the human passions which vivify the Greek mythology and literature, will never lose their significance and interest. Is it not probable, even, that the polished and philosophic Athenian regarded much of his Pantheon as purely symbolic, and much as it is regarded by the educated Englishman?

Let us have modern subjects by all means; but what modern subjects will enable a sculptor to achieve this greatest and most legitimate triumph of his art—the rendering of the naked majesty of the human form! If this triumph be achieved the pleasure it will afford will be very slightly modified whether we call the result "A Faun," or a "Youth Asleep," or "At a Stream," a "Venus," an "Eve," or a "Pose Plastique;" only that an abstract, not too familiar but poetical, theme is far better suited for the cold, white, chaste material than those commonplace, homely, vulgar subjects which always seem impertinences when done into marble. Following the practice of Mr. Gibson, Miss Hosmer has slightly tinted the figures in this work. There is no longer a doubt that the Greeks toned (by the encaustic process), and even painted their statues. To express the dark skins of the satyr race, they appear also to have used tinted marble and stone. There is in the capitol at Rome a very celebrated faun in *rosso antico*.

16 THE READING GIRL—Marble statue. P. Magni, Milan. (Not for sale.) *The Stereoscopic Company*. £300

17 JOSEPH KEEPING HIS FATHER'S SHEEP—Statue in marble. Miss E. Stebbins, Rome. £370

18 "HUSH, DON'T WAKE MY BABY"—Group in marble. P. Magni, Milan.—(See illustration.) £600

19 DIOGENES—Marble. R. La Barbera, Palermo. £204

20 PENSIVE INNOCENCE—Statue in marble. G. Obici, Rome. £400

21 QUEEN OF THE WATERS. C. Fraikin, Belgium. £68

22 MICHAEL ANGELO, WHEN A CHILD, SCULPTURING THE HEAD OF A FAUN, HIS FIRST WORK—Marble statue. E. Zocchi, Florence. £320

23 SAUL UNDER THE INFLUENCE OF THE EVIL SPIRIT—Colossal statue in marble. W. W. Story, Rome. £2,000

24 THE WOMAN TAKEN IN ADULTERY—Marble statue. P. Bernasconi, Milan. £180

25 CHRISTOPHER COLUMBUS—Colossal marble bust. P. Dellavedova, Turin. £100

26 GALILEO—Marble bust. V. Giani, Turin. £100

27 A VEILED CUPID—Marble Statue with Pedestal. A. Rosetti, Rome. £190

28 THE SWINGING GIRL—Marble statue. P. Magni, Milan. £1,500

29 STATUE OF DIANA, heroic size—Marble. Cav. G. M. Benzoni, Rome. £450

30 SAPPHO. J. R. Kirk, Dublin. £180

31 BOY AND SEA-SHELL—Statue in marble. J. R. Kirk, Dublin. £63

32 THE FAIRY OF THE WOODS—Marble. C. Fraikin, Belgium. £68

33 THE SULKY CHILD—Marble statue. A. Biella, Milan. £60. Although the subject is humble enough, the execution of this statue is very respectable and the forms true to nature. Every mother, we are sure, and everybody else whose heart is in the right place, will (forgetting, probably, all theories about the dignity of sculpture) sympathise with the distress of this little one as she rises in despair from the stool on which she has been

sitting poring over that "dog-eared" lesson-book, and, heedless of her unbuttoned pinafore, is ready almost to tear her hair, preliminary, we fear, to a piteous burst of crying. The statue is called in the catalogue "The Sulky Child," but it seems to us that the title given it by the Stereoscopic Company, the "Difficult Lesson," better expresses the artist's intention, and should be nearer the original Italian—what that is we cannot learn.

34 A GILLIE AND HOUND—Marble group. A. Munro, London. (For illustration see p. 480.) £630

A subject somewhat similar to that of this group has commended itself for treatment to one of our greatest sculptors. We allude to Mr. Gibson's "Hunter." That, however, is a work in the classical style, representing a nude young man, standing over and about to let slip from the leash a dog eager for the chase. The group before us is in what sculptors call the romantic or naturalistic style. It is not the first time Mr. Munro has been tempted to deal with a composition resembling this in its elements. Two or three years ago he had a similar group, called "Young Romilly," an illustration of the poem by Wordsworth, entitled "The Force of Prayer," and founded on the tradition of the youth who, in leaping the famous Yorkshire "strid," was checked by his dog, and fell into the "strangling arms of Wharf," and whose mother found in prayer, and in the erection of Bolton Priory the only consolation for his loss. The composition before us, however, of a young, barelegged gillie, in the jacket and short kilt of the Highlands, holding in a great stag-hound, as the pair swiftly yet stealthily advance, eying the game and waiting only for the crack of the rifle and the signal for pursuit. This composition is a considerable variation, not only as regards the character of the youth and hound, but also as regards the action of both; and a different idea had, of course, to be expressed. Of the spirit and animation with which the sculptor has treated his theme, and the suggestiveness of movement in both figures the engraving may give an idea. We will only add a word on "the handling" of the dog's coat, and the chiselling and undercutting of the ferns, foxgloves, and thick undergrowth, through which this sporting couple are struggling. These portions, then, are indicated rather than imitated with the minute precision of the Italians. But this, we think—if such textures are to be admitted at all as proper for representation in marble—is the proper limit for representation. To attempt to suggest more than the general "look of the thing" is almost certain to convey an impression of labour and of the inadequacy of the material, so true is the paradox in art that "a part is often greater than the whole."—*Illustrated News*.

35 NYMPH GOING TO BATHE—Marble statue. Lazzarini. M. Casentini.

36 BENIGNITY—Statue in marble. Prof. E. Baratta, Rome. £214

37 JUDITH—Marble statue. W. W. Story, Rome. £1,000

37A THE YOUNG SOLDIER—Group in marble. £500

37B AN INFANT—Statue in marble. £200

38 THE DRAWING GIRL—Marble statue. All three by P. Magni, Milan. £500

39 VANITY—Marble statue. Lazzarini, Lucca. M. Casentini. £500

40 THE BEGGARS—Marble group, one-third life-size. R. Galli, Milan. £200

41 THE LETTER—Marble statue. A. Tantardini, Milan. £200. This sculptor has acquired considerable reputation, both for ideal and naturalistic works. In this statuette the aim is, as we must think it, somewhat lower than in former works from the same hand we have seen. The sculptor here joins the host of his Italian brethren who strive after a picturesque and taking effect in sculpture. This little work is, notwithstanding, charming of its kind. The figure of the lady is refined and her costume graceful. Her employment, too, awakens interest, though we do not see that the perusal of the "letter" excites in the fair reader any emotion

in particular. The chief peculiarity in the workmanship is one common in modern Italian sculpture, and consists in the representation not merely of "drapery" in the old sculptural sense, but in the trivial imitation of the texture of silk, its angular folds, breaks, and "eyes," and even the original creases formed when it was in the piece, before it was made up. (For illustration see p. 481.)

**42 MODESTY**, a veiled bust—Marble pedestal. G. B. Lombardi, Rome. £65. (£100)

**43 PENELOPE**—Statue in marble. Kipkoo, Greece.

**44 THE LORELEI**, the Witch of the Rhine—Statue in marble. And **46 HERB POURING NECTAR FOR THE EAGLE OF JOYE**—Marble. G. Vook, Rome. each £175

**45 A BATHING**—Marble statue. G. Pierotti, Milan. £220

**47 HAGAR IN THE DESERT**—Statue in marble. Prof. V. Luccardi, Rome. £100

**48 INNOCENCE**—Marble statue. Cav. G. Albertoni, Turin. £60

**49 VICTORY**—Marble. After Rauch, Berlin.—(See illustration, p. 482.) £300

**50 THE REPENTANCE OF EVE**—Statue in marble. Prof. R. Rinaldi, Rome. £240

**51 OPHELIA**—Marble statue. W. C. Marshall, London. £300

**52 MATERNAL LOVE**—Group in marble. Cav. G. M. Benzoni, Rome. £160

**53 EVE AFTER THE FALL**—Marble statue. G. Argenti, Milan. £160

**53 LOVE ASLEEP**. Th. Geefs, Belgium. £150

**54 KINDNESS**—Group in marble. Cav. G. M. Benzoni, Rome. £160

**55 YOUNG DAVID PLAYING ON THE HARP**—Marble. G. Fontana, London. £250

**56 EVE**—Statue in marble. The late J. Hogan, Dublin. £100

**57 A SLEEPING VENUS**—Marble. C. Fraikin, Belgium. £80

**58 MOSES**—Marble. After Michael Angelo, Rome. £150

**59 INFANT BACCHUS**—Statue in marble. Prof. R. Rinaldi, Rome. £100



Gille and Hound, by A. Munro, London.



The Letter, by A. Tantarini, Milan.

- 61 MAZEPPA—Marble group. C. Corti, Milan. £200  
 62 THE SLAVE—Statuette in marble. £80  
 63 THE FLOWER GIRL—Statuette. F. Rigamonti, Milan. £100  
 64 PRAYER—Marble statuette. Prof. V. Vela, Turin. £160  
 65 BATHERS SURPRISED—Group in marble. G. Argenti, Milan. £140  
 66 SPRING—Marble statue. Prof. V. Vela, Turin. £480  
 67 MATER AMABILIS—Bust in marble. Cav. G. M. Benzoni, Rome. £60  
 68 BATHER SURPRISED—Marble statue. F. Romano, Milan. £80  
 69 THE FAIRY OF THE WATERS. C. Fraikin, Belgium. £48

- 69 THE INFANT SAVIOUR—Marble. G. D. Benzoni, Italy. £60  
 70 LAURA—Marble bust. A. Bottinelli, Milan. £30  
 71 MEDITATION—Bust, marble. G. Argenti, Milan. £30  
 72 DANTE'S BEATRICE—Marble bust. A. Tantarini, Milan. £32  
 73 THE VIRGIN—Marble statue.—(*Roman Court*). Valette, Paris. £100  
 74 ECCE HOMO—Bust in marble. G. Forzani, Rome. £43  
 75 SIMPLICITY—Marble bust. A. Colombo, Milan.  
 76 CHILD ASLEEP—Marble statue. G. Argenti, Milan. *Domenico Morelli, Naples.* £180  
 77 THE VEILED VIRGIN—Bust in marble. G. Strazza, Milan. £40  
 78 CAVOUR—Marble bust. V. Giani, Turin. £60  
 79 THE VIRGIN MARY—Marble bust. Cav. V. Fraccaroli, Milan. £60  
 80 THE SHEPHERD BOY—Statuette. F. Rigamonti, Milan. £75  
 81 THE TARPEIAN ROCK—Bronze.—(*Roman Court*). G. Halse, London. £52 10s.  
 82 BUST OF SIGNOR LAWSON—In marble. J. A. Acton, Rome. £50  
 83 BUST OF THE SAVIOUR—Marble. P. Schoeps, Rome. £63  
 84 PENELOPE AWAITING THE COMING OF ULYSSES—Marble. F. Brugger, Munich.—(For illustration, see page 482.) £150  
 This statuette, by the distinguished German sculptor, Brugger (a pupil of Schwanthaler), though a little conventional and cold, is, notwithstanding its reduced scale, one of the more noteworthy of the works in the classical style in the Exhibition. The contour, proportions, and disposition of the drapery show a nice feeling for Greek purity, symmetry, and graceful arrangement; while the execution has the conscientiousness which distinguishes the German school. Penelope (the faithful wife of Ulysses, or the Odysseus of the Greeks) stands in a sorrowful, wearied, and almost hopeless, yet still expectant attitude, resting her cheek on her hand, making no pretence to weave her web, awaiting the twenty-years' delayed return of her lord from the Trojan War, and those subsequent wanderings of which Homer sings in the "Odyssey." The shuttle she holds in her hand is, of course, in allusion to the web, or robe, regarding the weaving of which she deceived her importunate suitors—the web, or robe, which she declared she must finish for her aged father-in-law, Laertes, before she could make up her mind, and at which she worked in the day-time, but only to undo in the night what she had done in the day—an artifice which has led to the proverbial comparison of any interminable work to "Penelope's web."—*Illustrated London News.*  
 85 IMPRISONED CUPIDS—Marble. G. Motelli, Italy. £60  
 86 THE GENIUS OF WAR—Marble statuette. I. Micotti, Milan. £80  
 87 A SHEPHERD AND HIS DOG—Group in marble. Cav. I. Jacometti, Rome. £171  
 88 ITALY—Marble bust. P. Dal Negro, Milan. £30  
 89 ROMAN PEASANT—Marble. Cordier, Paris. £60  
 90 FIDELITY—Marble statue. E. Zocchi, Florence. £120  
 91 REBECCA GOING TO THE WELL—Plaster. *Near Machinery Court.*  
 92 BUST REPRESENTING PIETY—Marble. H. Baumer, Saxony. £38  
 93 NYDIA FLYING FROM POMPEII—Statue in marble. R. Rogers, Rome. £127  
 94 BUST OF A MOORISH SINGER AT ALGIERS—Marble. Cordier, Paris. £100  
 95 SLEEPING CHILD—Marble. J. R. Kirk, Dublin. £50  
 96 SAINT CECILIA—Marble. G. Motelli, Italy. £60  
 97 GIRL SMELLING A ROSE—Marble. G. Fontana, London. £100



Penelope Awaiting the Coming of Ulysses.

- 98 CUPID PROCLAIMING THE ROSE QUEEN OF THE FLOWERS—Statue in marble. A. Bienaimé, Rome. £100  
 99 BEATRICE CENCI—Marble statue. A. Bottinelli, Milan. £60  
 100 BACCHANTE—Colossal bust in marble. R. Cauer, Creuznach, Prussia. £100  
 101 BACCHANTE—Marble bust. A. Biella, Milan. £20  
 102 THE COQUETTE—Marble bust. F. Romano, Milan. £36  
 103 READING IN BED—Marble statuette. L. Cocchi, Milan. £35  
 104 MATER DOLOROSA—Bust in marble. Cav. I. Jacometti, Rome. £64  
 105 INNOCENCE IN DANGER—Statue in marble. A. Bisetti, Rome. £140  
 106 BUST OF REV. DR. LLOYD—Marble. C. Moore, London. £50  
 107 BUST OF A ROMAN LADY—Marble. E. Müller, Rome. £100

- 108 BUST OF GENERAL NAPIER—Marble. J. Adams, London. £50  
 109 OPHELIA—Marble statuette. L. Cocchi, Milan.  
 109A MARBLE BUST. 110 BUST OF LORD PALMERSTON—Marble. The late C. Moore, London. Each £50  
 111 THE BETROTHED—Marble bust. R. Pereda, Milan. £40  
 112 YOUNG BACCHANALIAN—Marble bust. A. Bottinelli, Milan. £30  
 113 BUST OF A LADY—Miss J. Morgan, Cork. £100  
 114 BUST—Marble. Late C. Moore, London. £50  
 115 TAMAR—Marble bust. G. Somajni, Milan. £25  
 116 A HUNTRESS—F. Provinciali, Rome. £107  
 117 A CIOCIARA (Girl from the Mountains)—Bust in marble. E. Müller, Rome. £109  
 118 EVE—Marble. Halse, London. £168  
 119 MATER AMABILIS—Cav. G. M. Benzoni, Rome. £25  
 120 ISHMAEL—Statue in marble. G. Strazza, Milan. £280  
 121 BUST OF BARON PLANA—Marble—(Transcript). G. Dini, Turin. £80  
 122 THE DANCE—Marble statue. £588. 123 MUSIC—Marble statue. P. Magni, Milan. £500  
 124 THE SON OF THE PEOPLE—Marble statue. A. Bottinelli, Milan. £140  
 125 BATHING GIRL—Plaster.  
 127 BUST, in marble. C. Moore, London. £100  
 128 "INNOCENCE"—Marble. G. Fontana, London. £105  
 129 BUST OF EDWARD VI.—Roubilliac. Lady Fanny Cole. £50  
 130 BUST OF FATHER MATTHEW—Marble. J. Hogan, Dublin. £50  
 131 THE IMMACULATE CONCEPTION—Marble. Prof. C. Kelli, Rome. £107  
 132 A ROMAN PHARANT—Marble. Brodie, London. £84  
 133 HALF-LENGTH REPRESENTING THE MATER DOLOROSA—Marble. Cav. G. M. Benzoni, Rome. £70  
 134 HOPE IN GOD—Marble statuette. Cav. G. M. Benzoni, Rome. £130  
 135 CHILD AND BIRD—Marble. Miss J. Morgan, Cork. £35  
 136 STATUETTE OF THE SAVIOUR—Marble (Transcript). Cav. I. Jacometti, Rome. £150  
 137 LITTLE NELLY. Miss A. Fremann, Rome. £50  
 138 A VEILED CUPID SLEEPING—Marble. G. B. Lombardi, Rome. £85  
 139 THE KISS OF JUDAS—Small copy in marble. Cav. I. Jacometti, Rome. £320  
 This is a reduced replica of a group by a Roman sculptor of eminence, which has already had a considerable success. The conception appears to us to have much merit, and the workmanship is unquestionably excellent. In this moderating and quibbling age there have not been wanting apologists even for Judas—men who would not even have "tied a millstone round his neck." But the sculptor, mindful of the exigencies of his art, has made Judas sufficiently hateful and contemptible in appearance, without descending to undignified or revolting grotesqueness and distortion. The Judas of the artist is a small but not exactly a mean-looking man; his shock head, hard, strongly-marked features, "villainously low" and beetling brow, aquiline nose, thin nostrils and lips, and farouche moustache, are the stereotyped characteristics with physiognomists of bold and crafty treachery and murderous ruthlessness. In rendering the expressions and gestures proper to our Lord and his betrayer, there was, however, more scope for displaying intelligence, feeling, and graphic power. The expression and gestures actually given appear to be very suitable and highly descriptive. Judas seems to have advanced towards Christ with stealthy cowardice from behind, or one side, hiding also the hand behind him in which he grasps the price of blood, the thirty pieces of silver. Yet with what horrible familiarity,

with what more than diabolical temerity, does he bow that sacred head to print on the brow the kiss which has become the type, the very byword, of utmost perfidy! The contrast of the expression and gesture of the Saviour deserves, we think, very high praise. With what all-knowing consciousness and Godlike mercy does the Redeemer submit to that profane hand and sacrilegious kiss. How admirably is the human and divine nature of the God-man indicated in the slight gesture of surprise with the right hand, and in that sorrowing expression shading the steadfast prevision and resolve to drink the bitter cup which may not pass from Him! Surely, the sculptor has gone very near to produce something memorably great in art.—*Illustrated News*.

140 BUST OF A ROMAN PEASANT—Marble. L. Prior, London. £60

141 THE HOLY FAMILY—Bas relief in marble. F. Ferrari, Rome. £70

141A STATUETTE, in marble. F. Ferrari, Rome. £70

142 OUR LADY OF SUCCOUR, with two Children under her Mantle—Alto-relievo in marble. G. Succetti, Rome. £50

143 BOY SLEEPING IN A SHELL, placed on three dragons, surrounded by nests of turtle doves—V. Brodzki, Rome. £75

144 BOY AWAKING IN A SHELL, turning on a pedestal which represents three dolphins or turtles—Marble. V. Brodzki, Rome. £65

145 BUST OF CHARLES MAKINS, Esq.—Marble. J. Adams, Rome. £105

146 BUST OF ST. AUGUSTUS—Marble. Cav. G. M. Benzoni, Rome. £30

147 FLORA—Bust in marble. F. Provinciali, Rome. £22

148 PASSUCIA—Marble. Shakspeare Wood, London. £26 5s.

149 MORNING PRAYER—Marble statuette. Cav. G. M. Benzoni, Rome.

150 EVANGELINE—Marble. Shakspeare Wood, London. £136 10s.

151 RACHEL—Statue in marble. F. Andrei, Rome. £77

152, 153 BUSTS OF ROMAN BOY AND GIRL—Marble. J. Adams, Rome. £50

154 REGINA MARTYRUM. Cav. G. M. Benzoni, Rome. £64

155 A SLAVE—Marble. F. Andrei, Rome. £64

156 ROME—Bust in marble. C. Barone, Rome. £40

157 ST. ANNA AND THE VIRGIN MARY—Marble, half life size. Cav. G. M. Benzoni, Rome. £120

158 LINDA DI CHAMOUNIX—Statue in marble. G. Biggi, Rome. £106

159 THE VIRGIN—Bust in marble. G. Setaccioli, Rome. £50

160 HALF-LENGTH REPRESENTING THE IMMACULATE CONCEPTION—Marble, Cav. G. M. Benzoni. Rome. £70

161 THE IMMACULATE CONCEPTION—Bust in marble. G. Forzani, Rome. £43

162 HOLY FAMILY—basso relievo—Marble. P. Palombi, Rome. £40

163 CONVERSION OF A PAGAN PRINCESS BY ST. GEORGE—Alto relievo in marble. W. Achtermann, Rome. £35

164 BUST OF CARDINAL WISEMAN. Cav. G. M. Benzoni, Rome. £80

164A BUST OF LORD SOUTHWELL—Marble. J. R. Kirk, Dublin. £50

165 CHILD AND CAT—Marble group. G. Freund, Rome. £60

166 BUST OF HIS HOLINESS PIUS IX—Marble. Cav. G. M. Benzoni, Rome. £70

167 HOPE IN GOD—Statue in marble, half size. A. Bisetti, Rome. £110

168 BOY AND DOG. F. Ferrari, Rome. £70

169 SUMMER—Statue in marble. Prof. E. Baratta, Rome. £69



Victory, after Rauch, Berlin.

170 BOY AND CAT—Marble. G. B. Lombardi, Rome. £85

171 WINTER—Statue in marble. Prof. E. Baratta, Rome. £69

172 THE STRIFE BETWEEN CUPID AND MERCURY—Marble. F. Fabj-Altini, Rome. £100

173 ST. JOSEPH WITH THE LILY—Marble statue, half life size. C. Hoffmann, Rome. £85

174 VIOLA, ideal head from Bulwer's Zanoni—Medallion in marble, Miss Margaret F. Foley, Rome. £40

175 HEBE—A marble medallion. Shakspeare Wood, London. £26 5s.

176 PASSUCIA, THE CELEBRATED ROMAN MODEL—Portrait medallion in marble. Miss Margaret F. Foley, Rome. £50

177 MEDALLION PORTRAIT OF REV. FRANCIS B. WOODWARD. Shakspeare Wood, London. £26 5s.

178 THE VIRGIN—Basso relievo in marble. L. Majoli, Rome. £22

179 BUST OF THE VIRGIN—Marble. Cav. G. M. Benzoni, Rome.

180 GROUP OF CAT AND QUAIL—Plaster. G. Lombardi, Rome. £42

181 BUST OF THE REDEEMER—Marble. Cav. G. M. Benzoni, Rome. £40

- 182 THE FIRST STEP ON THE PATH OF GLORY—Statue in marble. A. Bisetti, Rome. £150  
 183 THE YOUNG ST. JOHN—Statue in marble. Prof. L. Bienaimè, Rome. £70  
 184 DIVINE LOVE—Statue in marble. Prof. L. Bienaimè, Rome. £70  
 184A THE READING GIRL—Statue in marble. P. Magni, Milan. £800  
 185 HIS HOLINESS PIUS IX.—Colossal statue in marble. F. Matteini, Rome. £1,700  
 186 FAITH IN GOD. Prof. L. Bienaimè, Rome. £70  
 187 MOSES EXPOSED ON THE NILE—Statuette in marble. S. Galletti, Rome. £53  
 188 THE INFANT JESUS WITH ST. JOHN—Group in marble. F. Andrei, Rome. £36  
 189 A SHEPHERDESS WITH GOAT AND KID—Group in marble. Cav. I. Jacometti, Rome. £214  
 190 THE INFANT JESUS SLEEPING AND DREAMING OF HIS CROSS AND PASSION—Statuette in marble. S. Galletti, Rome. £53  
 191 CUPID CAUGHT FLYING—Group in Marble. E. Davis, London. £100  
 192 BRITOMARTIS—Plaster. (near Machinery Court.) E. Wyon, London.  
 193 THE GOOD SHEPHERD. G. Lucchetti, Rome. £45  
 193A ZEPHYR PRESENTING FLOWERS—Marble statuette. C. Salvatori, Rome. £70  
 194 "THE LOVE TEST"—Plaster. C. B. Birch, London.  
 195 A RECUMBENT NYMPH—Marble. Baron Von Hoyer, Saxony. £130  
 196 ERIN AND BRIAN BOIROIHME—Group in plaster. J. Hogan, Dublin.  
 197 MARBLE HAND—Paper weight. Settacioli, Rome. £15  
 198 HER MAJESTY THE QUEEN—Plaster. Mrs. Thornycroft, London.  
 199 ERIN—Statue in plaster. Valette, Paris.  
 200 THE PRINCESS BEATRICE—Plaster. Mrs. Thornycroft, London.  
 201 PIETÀ—In plaster. J. Farrell, Dublin.

Although there is no direct authorization in the Gospel narratives for this representation; and it can only be said (setting tradition aside) that the taking down of the body of our Saviour from the cross was very probably witnessed by his mother Mary, yet the incident of this group has, doubtless, been regarded for many centuries in the Roman Catholic Church as having actually occurred; and to doubt it would probably be deemed heretical by every pious Catholic. The fact of the admission of such a representation into the Church would be quite sufficient authentication. While, too, it has not the spiritual and symbolical meanings and accessories of the "Virgin and Child," the mode of the representation is nevertheless almost as strictly defined, the subject is nearly as frequently to be seen, and the remarks we have made on the class of works to which M. Montagny's group belongs, are closely applicable to it. So generally recognized has the subject been that the Italian word *pietà* long since acquired a special technical sense in designating it, in addition to the other meanings of the word, such as love of kindred, piety, and pity. The inexpressible pathos of the subject, as well as its adoption for ecclesiastical purposes, has, perhaps, swelled the number of those great artists who have ventured to treat it. The reader may remember many noble versions of the subject; but we will content ourselves with recalling the most famous—Michael Angelo's "Pietà," in the Capella della Pietà, in St. Peter's. The particular repetition by Mr. J. Farrell, of Dublin, is creditably modelled, and distinguished by considerable feeling, without being spasmodic and repulsive, like the treatment of the subject by some modern Italian sculptors.—*Illustrated London News*.

202 SKETCH FOR STATUE OF THE LATE JOHN R. GODLEY—Plaster. T. Woolner, London.

203 MADONNA AND CHILD—Alto-relievo—In marble and plaster (in *Transept*). E. Davis, London.

- 204 BUST OF THOMAS COMBE, Esq. T. Woolner, London. £50  
 205 BUST OF M. DALY—Plaster. M. Daly, Rome. £20  
 206 BUST OF CAPTAIN BURTON—Plaster. E. Papworth, London.  
 207 THE SHEPHERD BOY—Marble. J. Hogan, Dublin. £50  
 208 THE YOUNG SHRIMPER—Plaster. E. Papworth, London.  
 209 HAMADRYADS—Basso-relievo in marble. F. Thrupp, London. £50  
 210 THE YOUNG EMIGRANT—Plaster. E. Papworth, London.  
 211 TWILIGHT—Marble basso-relievo. A. Munro, London. £30  
 212 SABBINA—Marble alto-relievo. A. Munro, London. £120  
 213 MATERNAL JOY—Marble basso-relievo. A. Munro, London. £80  
 214 BULL FIGHT—Plaster. Major Powell, London.  
 215 THE REDEEMER—Colossal marble bust. Cav. V. Fraccaroli, Milan. £80  
 216 A YOUNG ALBANESE—Bas-relief in marble. Miss Margaret F. Foley, Rome. £40  
 217 JOAN OF ARC—Statue in marble. A. Munro, London. £150  
 218 SAINT JOHN—Marble. G. Adams. £50  
 220 BOY ASLEEP—Plaster. A. Munro, London. £26 5s.  
 221 HIS HOLINESS THE POPE—Marble bust. B. Bernardi, Bologna. (In the *Transept*.) £80  
 222 SIR GALAHAD—Marble. Mrs. D. O. Hill, Edinburgh. £120  
 223 BUST OF THE LATE DUKE OF WELLINGTON—Marble. G. Adams. £100  
 223A BUST, in marble. A. Amelia Paton, Edinburgh. £50  
 224 A FAUN, in bronze. F. Moratilla, Rome. £100  
 225 BUST OF BARRY CORNWALL—Plaster. J. H. Foley, London.  
 226 BUST OF THE LATE JOHN HOGAN, SCULPTOR—Plaster. J. Hogan (the younger), Rome.  
 227 BUST OF THE REV. W. ANDERDON—Plaster. J. Cahill.  
 228 BUST OF THE LORD MAYOR—Plaster. J. Watkins.  
 229 BUST OF YOUNG GIRL—Plaster. J. Watkins. £5 5s.  
 230 SAMSON BURSTING HIS BONDS—Plaster. L. Wiener, Belgium.  
 231 BOAR AND DOGS—Group in bronze. (In *Zollereim Court*.) W. Wolff, Berlin. £95  
 232 VICTORY—Figure in zinc, bronzed, after Rauch. (Zollereim Court.) M. Geiss, Berlin. (See p. 483.) £42  
 233 LITTLE RED RIDING HOOD—Plaster. (Zollereim Court.) R. Cauer, Creuznach. £1 5s.  
 234 DORNROSCHE PRICKED BY FALLING ON THE SPINDLE WHEN ASLEEP—Model in plaster. (Zollereim Court.) R. Cauer, Creuznach. Price, executed in marble, £250  
 235 THE BABES IN THE WOOD—Plaster. R. Cauer, Creuznach.  
 236 MALIBRAN—Plaster. G. Geefs, Belgium.  
 237 THOUGHT—Statue in plaster. Miss J. Morgan, Cork. £15  
 238 MADONNA AND CHILD—Plaster. Montagny, Paris. £18  
 239 BUST OF THE PRINCESS ALICE. Mrs. Thornycroft, London.  
 239A BUST OF THE PRINCESS ALEXANDRA—Plaster. Mrs. Thornycroft, London.  
 240 THE TOILET—Plaster.  
 241 MIRANDA—Plaster. R. Wyon, London.  
 242 THE SULLAMITE—Plaster. O. Buccini, Naples.  
 243 CHRIST IN THE GARDEN—Statue in plaster. P. Della Vedova, Turin. £120  
 244 BRISIS—Plaster. E. Wyon, London.

## In the East Corridor.

- 245 THE GUARDIAN ANGEL—Plaster. Montigny, Paris. £16  
 246 MOSES—Plaster. T. Woolner, London.  
 247 THE ORPHAN FLOWER GIRL—Plaster. J. D. Critchenden.  
 248 MONUMENT TO LATE VISCOUNT MASSERENE AND FERRARD—In Caen stone. J. R. Kirk, Dublin.  
 249 ST. JOSEPH EXPLAINING ISAIAH TO THE INFANT JESUS—Terra cotta. Montigny, Paris. £30  
 250 SAINT LOUIS DE GONZAGUE—Plaster. Montigny, Paris. £15  
 251 SLAUGHTER OF THE INNOCENTS—Plaster.—G. Adams.

252 MADONNA—Plaster. Montigny, Paris. £12  
 This group of the Virgin and Child is an excellent piece of workmanship of its kind, and representative of a phase of art, or—as it might generally be more properly called—of art manufacture, which is in wide demand in Roman Catholic countries, and is largely exemplified in the Dublin Exhibition. This Virgin and Child may be said to belong to a distinct class of iconographic art. It is an instance of art with, as the phrase is, “a purpose,” as was that of the old Greeks. Its destination is, doubtless, the Church, and it was designed to appeal to faith and to quicken devotion rather than to challenge criticism and gratify æsthetic sentiment. Precisely similar compositions, occasionally like this, in white plaster or marble, but more often sumptuously coloured and gilt, and frequently clad, in actual draperies of the richest description, and bedecked with gold and silver ornaments and precious stones, are to be seen in every Roman Catholic church at home as well as abroad. Being intended strictly as, at least, a visible medium for adoration, the whole conception is conventional: it is neither imitative nor representative. While preserving the relationship between Mother and Child, the artist does not present the Virgin and the Infant Saviour as they may have appeared on earth, but as they should be perceived glorified through the eye of faith. The “Mother of God” stands on the world “bruising the head of the serpent,” and inviting all men to accept her mediation and receive pardon and blessing from her Son. The Divine Infant, though still carried in his Mother’s arms, is invested with the sovereignty of the world he has redeemed—typified by the globe surmounted by a cross which he bears in his hand; while, as the glorified Saviour, he raises his two fore-fingers making the well-known sign of benediction of the Western Church. Once such a conventional representation as this is adopted, nothing in the history of art is so remarkable as its uniform preservation from age to age. Here we have the same ideas that were embodied for representation a thousand years ago in Byzantine mosaics, the same that were transmitted in the twelfth, thirteenth, and fourteenth century sculptures and paintings, and so on, for example, Van Eyck, Raphael, Murillo, the conquerors of South America, and, with few variations, the monks of Mount Athos. The explanation, of course, is that the representation—the image—comes unconsciously to be regarded as sacred because what it represents is sacred. To attempt to make the least change in the form or symbolism of such an image would have been deemed as heterodox as to try to subvert the established ideas it embodies.—*Illustrated News.*

- 253 BUST OF LORD SEATON—Plaster. G. Adams.  
 254 BUST OF LORD GOSCH—Plaster. G. Adams.  
 255, 256, 257 ANTIQUE MARBLE BUSTS. E. W. O'Mahony, Esq.

## Upper Central Hall.

- 258 THE MEETING OF REBECCA AND ISAAC—Marble. G. B. Lombardi, Rome. £95  
 259 THE REDEEMER ANNOUNCING PEACE TO THE WORLD—Statue in marble. V. Brodzki, Rome. £65  
 260 ATALA AND CHACTAS—Marble group. Cav. V. Francarull, Milan. £200

- 261 THE NURSE EGERIA—Marble statuette. G. Somagni, Milan. £40  
 262 VENUS. G. Somagni, Milan. £100  
 263 FIRST STEPS—Marble statuette. P. Magni, Milan. £300  
 264 FRANKLIN ASPIRING TO MORAL PERFECTION—Marble statuette. D. Menconi, Florence. £32  
 265 RUTH—Statuette in marble. J. Adams, Rome. £126  
 266 TAMAR—Statue in marble. G. Strazza, Milan. £93  
 267 REBECCA, VEILED, PRESENTED TO HER BRIDEGROOM—Marble. Cav. G. M. Benzoni, Rome. £80

## In Water Colour Room.

- 268 PRAIRIE INDIAN HUNTING THE BISON—Plaster. Major Powell, London.  
 269 COMBAT BETWEEN BRITISH DRAGOON AND KAFFIR—Plaster. Major Powell, London.  
 270 INCIDENT IN THE HUNGARIAN WAR—Plaster. Major Powell, London.  
 271 THE WRESTLERS—Group in plaster. Professor Molin, Sweden.  
 272 VENUS AND JUPITER—Two bassi-relievi in plaster. (*In West Gallery of Transept.*) Schilling, Saxony.  
 273 STATUE OF JOSIAH WEDGWOOD, erected at Stoke upon Trent in 1863, plaster. (*In Passage to Carriage Court.*) E. Davis.

## In the Transept.

- 274 RAPHAEL, from the original in the Royal Dresden Gallery—Cast. Hahnel, Saxony. £100  
 275 CHRIST AND THE REPENTANT MAGDALEN—Plaster. W. Schwenk, Saxony.  
 276 RETURN OF THE PRODIGAL SON—Plaster. W. Schwenk, Saxony.  
 277 LOVE AND FOLLY—Plaster group. Professor P. Ricca, Naples.  
 278 PROGRESS—Terra-cotta group. Professor P. Ricca, Naples.  
 280 TWO ANGELS BEARING UP THE ARMS OF ST. FRANCIS—Terra cotta. Professor P. Ricca, Naples.  
 281 PIETRO DELLE VIDE—Terra cotta group. Professor P. Ricca, Naples.  
 279 A FARMER MERCHANT—Plaster. J. H. Foley, London.  
 282 THE MISTRESS AND HER DOVE—Statuette. F. Bigazzoni, Milan. £100  
 283 TAMAR—Bust in marble. G. Somajni, Milan. £20  
 284 BUST OF THE ADOLORATA—Marble. C. Giacomini, Rome. £50  
 285 BUST—In marble. C. Giacomini, Rome. £50  
 286 BUST OF A CHILD—Marble. R. Wilkinson. H. E. Hime, Esq. £50  
 287 H.R.H. THE PRINCE OF WALES—Colossal bust in plaster. Marshall Wood, London.  
 288 DANAE—Plaster. Marshall Wood, London.  
 289 and 290 BUSTS OF THE PRINCE AND PRINCESS OF WALES. Marshall Wood, London. £50  
 291 BUST—In marble. G. Dini, Turin.  
 292 MODELS OF RUINS IN ROMAN FORUM, in Giallo antico, £115; 293 SAME, in Rosso antico, £160; 294 PAIR OF VASES, in Rosso antico, bell shaped, £35; 295 PAIR OF TAZZI, in Rosso antico, £55; 296 TRAJAN'S COLUMN, in Rosso antico, £50; 297 PAIR OF VASES, in Rosso antico, lacrymatory shape, £35. Horsaksky and Caracciocchi, Rome.—(*In the Roman Court.*)  
 298 PAN AND PSYCHE; 299 FAUN FAMILY—Models in plaster. Eggs, Berlin.—(*South Corridor.*)  
 300\* MATER SALVATORIS. Marble alto-relievo, by Spertal. (No. 27 in Roman Catalogue.) This alto-relievo, or as it might perhaps now properly be called, mezzo-relievo, belongs to a similar class of religious art

to that of the groups of the "Virgin and Child," and the "Pieth," and of which class there were many examples in the Exhibition, addressed, of course to the large proportion of Roman Catholics among the visitors. But it is a more naturalistic representation than the group of the same subject just mentioned. The artist has, however, introduced the emblem of Christ's future sufferings, and represented the Divine Infant regarding it with omniscient prevision. The "Mother of the Saviour"—to translate the patristic Latin of the title—seems also to foresee or feel a presentiment of her son's passion, as she sadly kisses his head. The composition is similar to many of the Madonnas of Raphael and the early Italian painters, as well as to many reliefs by Italian sculptors—to name one, the highly-interesting unfinished relief by Michael Angelo, which, with the "diploma pictures," and other art treasures, are lost to the public in the rooms of the Royal Academy. The execution of the work is good, and evinces knowledge of the true principles of plastic treatment on a tablet ground. The relief is in a carved frame; it has the title and name of the sculptor incised on it, and was doubtless intended for the chapel of some church, or a private or conventual oratory. It was not placed among the sculpture generally, but was to be found against the wall in the Roman department.

#### STATUARY EXHIBITED BY G. M. CASENTINI, OF LUCCA.

301 DIANA, from the antique—Marble, £80; 302 EVE, WITH CAIN AND ABEL, after Thorwaldsen, £80; 303 BOY AND WATCH, £50; 304 VENUS, after Canova, £60; 305 VENUS AND CUPID, after Fraikin, £80; 306 THE THREE GRACES, after Canova; 307 SHEPHERDESS, £80; 308 VENUS DE MEDICI, after the antique; 309 BOY EXTRACTING THORN FROM HIS FOOT, £100; 310 CUPIDS FIGHTING FOR THE HEART, after Flamingo, £60; 311 PEASANT GIRL SOWING SEED, £50; 312 GUARDIAN ANGEL, after Bienaimé, £80; 313 BOY SLEEPING, after Flamingo, £25; 314 SAINT JOHN, £30; 315 EVE WITH THE APPLE, after Thorwaldsen; 316 VENUS AND ADONIS, after Canova; 317 GIRL MAKING A NET, £80; 320 TOILET BY THE

RIVER SIDE, £80; 321 FIDELITY, £100; 324 APPLICATION, £80; 325 VENUS AND CUPID, after Fraikin, £100; 326 BIRTH OF VENUS, £50; 327 INNOCENCE, £35; 328 BOY AWAKENING, £35; 329, 330 PRIMAVERA (Spring) and (Autumn), each, £120; 331, 332 DANCING GIRL, after Canova, and Pendant, each, £75; 333 GIRL AND KITTEN, £25; 334, 335 BOY WITH BIRD'S NEST and Pendant; each, £25; 336 THE IMMACULATE VIRGIN, £50; 337 MADONNA, after RAPHAEL, £110; 338 READING GIRL, £50; 339 THE DEATH OF FRANCO FERUCCI, £50; 340 PLO IX.—Bust, £12; 341 BATHING GIRL—Casentini; 342 VANITY—Casentini; 343 EDUCATION—Casentini.

Statues for the Hall or Garden.—344 CERES, from the antique, £50; 345 PSYCHE, after Canova, £50; 346 NEMESIS, £50; 347, 348 BACCHANTE, and Pendant, each, £90; 349 INNOCENCE, £40; 350 VENUS, after Canova, £45; 351 PSYCHE, after Thorwaldsen; 352 VENUS OF NERO, 40; 353 A collection of Vases, Tazzi, and other ornamental works, in alabaster of Volterra, £100.—(In the Passage to Refreshment Room, of South Corridor, and in the Transsept.)

## B—CAMEOS AND MOSAICS.

### CAMEOS.

#### Roman Court.

354 PROLEMY II. AND HIS QUEEN, ARRINOIA.—Oriental onyx. Chev. P. Girometti, Rome.

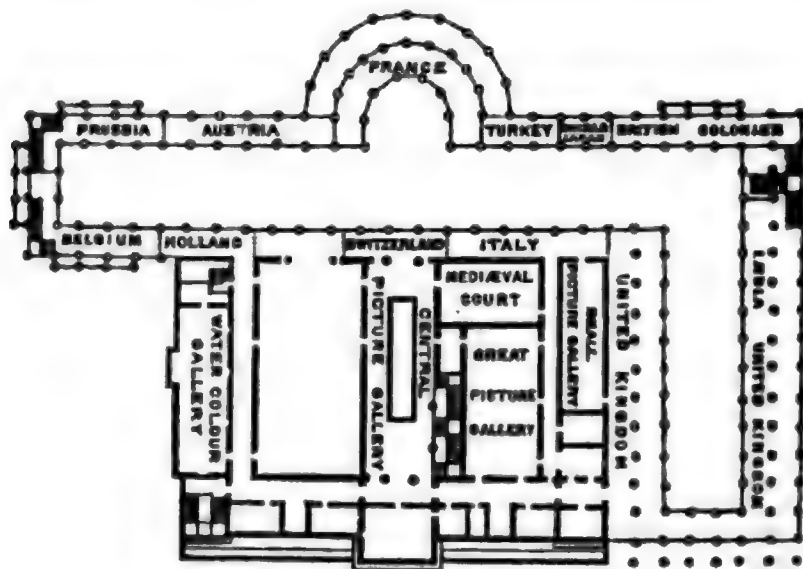
355 ACHILLES—Cameo of Oriental onyx. The other half of this stone is in the Museum of the Vatican.

356 BACCHANTE WITH GRAPES—cameo in sardonyx. P. Girometti, jun., Rome.

#### VENETIAN ENAMEL MOSAICS, BY D. SALVIATI.

##### At head of South-eastern Staircase.

THE SAVIOUR, from the original in St. Mark's, Venice, price £50; ST. EZEKIEL, from St. Mark's, £30; ST. NICHOLAS, from St. Sophia's, Constantinople, £20; A LAMB, £10; SPECIMENS OF MOSAIC, for a Herodes, £10 and £8; SPECIMEN OF MOSAIC, for floor, per square foot, £3; THE VIRGIN, from the Church of Murano, £25.



Plan of the Galleries.

*Remarks on the various Ancient and Modern Schools of Painting.*

BY A DISTINGUISHED ARTIST.

IN reviewing the collection of paintings as a whole it is not our intention to criticise or describe particular works in detail; in fact, to write a catalogue raisonné. The most elaborate description of any painting must fail to impress the reader who has not seen it with its true merits and attractions; and to those who have seen it written description is superfluous. Of course it is quite practicable to criticise the performance, to point out defects in treatment, applaud merits, and excite the imagination by highly-wrought description; but art has its own language, and in the absence of the work itself, its real merits are incommunicable. What we propose is rather to analyse the motives of the various Schools, to illustrate the success or failure by reference to one or more leading works in each section, and test generally how far the collection brought together in Dublin in 1865 may be held to exhibit the state of European art.

It must be admitted that with some exceptions, to be more particularly noticed presently, the several European schools of painting have not been adequately represented. Such a result could only be obtained by a concurrence of all the leading artists, or by the liberality of the Sovereigns or Governments of the various countries. After so recent an International Exhibition as that of 1862, and with the immediate prospect of one in Paris in 1867, but little aid could be expected from those artists who might fairly be esteemed the representative men of their time; indeed, from them at any time few contributions could be expected; their greatest works are either in the public galleries, or the private collections of royalty or of wealthy individuals, and their time is absorbed in the fulfilment of important commissions. It is not unreasonable that great difficulties should arise in obtaining loans of *chefs d'œuvre* from either public or private collections; and, on the whole, it is more matter of congratulation that so many valuable works should have been obtained from such sources, than of wonder that many royal and other proprietors should have declined to contribute.

At the same time it is to be observed, that less excuse can be made for royal or governmental chicanery than for that of individuals. In this age of progress and intercourse of nations, these great Exhibitions become rallying points for visitors from all parts; they are not mere marts for the sale of art or industry, they are the genius congresses of the world, where mind is represented not by men but by their productions. It is a duty that governments owe the nations governed by them to secure them an adequate representation.

That this has been liberally and effectually done in many instances in this Exhibition must have been a source of gratification to its promoters, as it has been of great importance to the Exhibition. Her Majesty the Queen most graciously placed many gems from her private collections at the disposal of the committee, and the Trustees of the National Collection have well aided in securing a fair representation of the British School, as far as they had available material. To the liberality of the Spanish Government we are indebted for a most interesting and important representation of the modern Spanish School. The Italian Government and the King of Saxony both contributed in this section, and to the Pope the Exhibition was indebted for contributions from the Mosaic works of the Vatican.

To the ANCIENT MASTERS priority is naturally given in the catalogue, and we may fairly adopt its sequence. The collection brought together contained some works of paramount interest, but as a whole was deficient in that variety and excellence which we look for in a representative exhibition. It is only as a display illustrative of past achievements as standards of comparison, that the works of the ancient masters should at all find a place in these international gatherings which are intended to exhibit and stimulate modern progress; and difficult as it is to draw together the great works of living artists, it is ten times more so to collect those of the past. The works—the true representative works—are dispersed widely, conserved in great public galleries, where they are immovable, or jealously hoarded in private collections whose proprietors are naturally unwilling to run the risk of loss or damage to works impossible to replace. Marvellous indeed was the display of courage and public spirit, both of promoters and contributors, which resulted in the Art Treasures Exhibition in Manchester; but the occasion which elicited all the elements of national pride may be presumed also to have somewhat exhausted the generosity of proprietors. Still the greater, therefore, was the obligation of the promoters of the present Exhibition to the few who generously placed valuable works at their disposal. Chief among these was the Earl of Warwick, and foremost among his contributions in

merit was the portrait of a man in crimson and black dress, by Moroni, the cotemporary and rival of Titian. In presence of such a work as this we feel the true value and rank of portraiture; we recognize the broad truth of the human type and unmistakable individuality, distinct alike from the partial and frequently harsh truism of photography and the maudlin false flattery that too often pervades modern fashionable portrait painting. In fact, we are always, in great portraits, more impressed with their characteristic individuality than their mere mapping of features. Not far from this portrait is one well known—in Ireland at least—a portrait by Titian, contributed by Lord Charlemont, generally but erroneously called Cæsar Borgia. Here the same calm individuality is depicted, and the mind looks out through the deep dark eye. A portrait of a Duke of Ferrara by Dosso Dossi, a man in black dress by Porbus, and a portrait of the Earl of Arundel by Rubens, all contributed by Lord Warwick, are pictures worthy of note. The portrait of Ryckhaert, the painter, attributed to Vandyck, is scarcely by his hand; the original, a fine work indeed, is in the museum of Madrid. Of a different school, but equally full of truth, are the portraits of Gerard Dow and Rembrandt, painted by themselves, both contributed by Lord Portarlington—the first a very pure specimen of the master, the latter forcible and true. Two whole-length portraits by Vandyck, also from Lord Portarlington's collection, Queen Henrietta Maria and her dwarf, Sir Geoffrey Hudson, the subjects of one, and Earl Newport of the other, true but comparatively tame. The head of a Jewish Rabbi, by Rembrandt, exhibited by Lord Powerscourt, is a work remarkable by its breadth of character, marked individuality, and powerful *chiaroscuro*. There are several repetitions of this work, but not by Rembrandt: one in Vienna is attributed to his pupil Eckhout. The portrait of Jean Paul Contarini, exhibited also by Lord Powerscourt, has some of the high characteristics of Tintoretto's pencil; and a portrait near it by Titian, from the same collection, is full of interesting character and broad treatment, although it has suffered from over-cleaning. Of the earlier British school in this department, Sir Joshua Reynolds's portrait of the Duchess of Leinster, contributed by his Grace from the collection at Carton, and the portrait of the Duchess of Bolton by Hogarth, contributed by Mr. Brinsley Marlay, are most noteworthy.

We have been led into notice of the portraits in the collection by the striking excellence of some, and the feeling that, on the whole, they were, perhaps, the most important works, and those from the study of which most was to be learned. Naturally, religious and historic art should take precedence; but works of the highest class are just those most difficult to obtain for temporary exhibition. That art owes its highest development to its enlistment in the cause of religion, from the earliest efforts to realize abstract idealities to its fullest development in presenting its history—its traditions and its impressive teachings through its saints and martyrs, or by allegories, is undoubtedly true. Its teachings were, however, for a time gone by, and the want of sympathy in the subjects treated, whether sacred or profane, is for the majority a drawback to the real enjoyment of even the finest works. Yet all the highest qualities of invention, drawing, colour, and earnest character are to be found in the earliest art; in some the mental or spiritual feelings prevailed, while in others, as in the works of the great Venetians, colour and the radiant reality of life are dominant.

Of the earlier Italian period, some interesting works were contributed by the Marquis of Lothian, especially the "Crowning of the Virgin," by Filippo Lippi, full of gentle loveliness; the small picture by Masaccio, belonging to Lord Powerscourt, "The Birth of the Virgin," is full of the same simplicity and earnestness, with a happy pervading sense of colour, although here the *etax rerum* and the inevitable restorer have left their marks. The "Madonna on a Throne," by Francisco da Imola, from Lord Portarlington's collection, is worthy of note; and Mr. Brinsley Marlay contributed a picture remarkable for action, composition, and especially for colour, by Scarsellino de Ferrara—"Christ Led to Execution."

The great Venetian colourists were but feebly represented, with the exception of the portraits to which we have already referred; for we cannot regard the heavy allegories by Paolo Veronese, well known as they are—"Le Degout," "L'Amour Heureux," "L'infidélité," and "Le Respect"—as representing in any adequate manner the genius and power of the painter of the "Marriage of Cana" in the Louvre. The "Landing of St. Paula" is a very pleasing specimen of Claude Lorraine's happiest style. Of early German art there was a curious work by Lucas Cranach, and two pictures attributed to Van Eyck, possessed many qualities of that school, but certainly were not by either of the great masters of that name of marvellous renown.

Of the Dutch School, wonderful for its mechanical excellence and truthful representation of life, though frequently not of the most refined classes, some pleasing specimens were contributed by Sir Charles Coote, the Lord Chancellor, Lord Warwick, and Mr. J. C. Lyons. Few pictures fixed the attention of all visitors more than the head of a cow—a short-horned too—by Cuyp—marvellous for its thorough life and broad truth of pencil. The Duke of Leinster's small landscape, with cattle, by Cuyp, is a very genuine specimen of the master. But we are warned from dry details of works, in which the art itself alone is eloquent, by the fear of



more fortunate competitors. In Ireland, indeed, the artist's career has been, and continues to be, a long struggle against adverse circumstances; the most forward and fortunate of our countrymen are those who settle in the great metropolis, and whose name and fame become merged in the prosperity of the British School. In some degree this is inevitable: but if we contrast the state of art patronage and progress in Scotland with that of Ireland, we cannot but feel that all is not done in Ireland which might be expected from the wealthy and educated classes to develop and foster the talent which undoubtedly abounds in the country.

Of one branch of art, essentially a glory of the British School—water-colour painting—we may deplore an inadequate representation as a whole, while we cannot but feel that Irish genius was paramount, and that the gems of the collection were the works of men of Irish birth. The steadiest progress in modern art is, perhaps, traceable in water-colours from the dry but truthful efforts of the Sandbys, some eighty years ago, to the full bloom and power of the present day, when water-colours compete even in depth of tone and vigour of execution, as they must always, in luminous effect, with oil painting. One work may be referred to in that collection as illustrative of the earlier period of pure water-colour art and the transition due to more expanded range and adaptability to pictorial effect; the work of the venerated veteran George Petrie, who, amid all the occupations which the varied powers of his mind involved him in, cultivated with almost filial devotion the practice of pure water-colour art, combining with, perhaps, a somewhat dry manner, a high appreciation of the beauty of form and the ineffable poetry of mountain scenery.

We shall glance but rapidly at the other schools of modern painting as represented in the Exhibition. Of the French School there was scarcely a representation; one or two works of a very high character, contributed from private collections, were all that could be claimed as illustrating the genius of our Gallic neighbours. Not so of Belgium, which had a very numerous display, but essentially deficient in evidences of its highest powers, and the consequent rank which its artists have deservedly attained. The Schools of Saxony and Düsseldorf were, on the whole, far better represented—thanks, in the case of Saxony, to the liberality of the King. The Scandinavian was even more worthily represented than that of Düsseldorf, while Sweden and Denmark contributed a very interesting collection of works “racy of the soil” and sea. Many of the scenes of the interior life of those countries were admirably illustrated; but it must be admitted that, with the exception of the works of Tidemand and Fagerlin, there was more of pleasing painting than high aim or instructive art in these numerous contributions. Both the Roman School and that of Italy contributed works of interest and aim; but the reputation of their sculptors, sustained by such a galaxy of marbles as graced the central hall and nave, completely eclipsed the fame of their painters.

Of two Foreign Schools we have yet to speak, and they may the more properly be retained for the last, as they will have left the most important impression on the minds of all visitors to the Exhibition, and have given it its highest *prestige*. The Spanish paintings, contributed so liberally by the Government of Spain, and the striking collection of cartoons from Munich, which covered as with a glory the walls of the great concert room, happily prove that the mission of art as a teacher is not sped utterly, and that its success is always proportionate to the intensity of its purpose. A peculiar propriety and simplicity distinguished the works of the principal Spanish painters—a propriety which makes all the difference between painting and picture-making. Of the many important works in this school we shall refer but to two, as illustrating in an eminent degree its highest qualities. They happened to be placed in juxtaposition in the great music hall. One was “The Funeral Convoy of Friar Felix Lope de Vega Carpio, passing before the Convent of the Nuns of the Trinity at Madrid, wherein was his Daughter”—by Llanos; the other, “The Funeral of Saint Lorenzo in the Catacombs of Rome”—by Vera. Nothing could exceed the simple truthfulness of the first picture—the entire absence of conventional composition, yet the happy pictorial result; while the second, in grouping and general treatment, almost conventional, at least perfectly in rule, impressed the spectator only with its truthfulness as a tale; in both the interest of subject was paramount. It is only lately that the modern Spanish School has begun to be known out of Spain; yet it exhibits great vitality and health.

Cartoons, without colour, such as those collected from Munich, have rarely been made the subjects of public exhibition; they are, after all, but the preparation for great finished works; yet it must be admitted that they sometimes have more of the master impress upon them than the very works for which they are but studies. The painter, working out his idea with the simplest possible means of expression, is free from the embarrassment of colour and the technicalities of material. Whether or not the artist succeed in making his finished work greater than the cartoon, at least it is clear that the last must embody all the highest elements of his art: and we think that a high appreciation of the great men of Munich must have fixed itself on the minds of all who studied those admirable cartoons; while to the art student they are important lessons in composition, drawing, and, above all, great examples of conscientious industry in the effort at excellence.











- 1 WOLF HUNT. *Snyders. Marquis of Drogheda.*
  - 2 LANDSCAPE AND FIGURES. *Teniers (the Elder). Sir Charles Coote, Bart.*
  - 3 ROCKY LANDSCAPE. *Salvator Rosa. John C. Lyons, Esq.*
  - 4 HAWKING PARTY. *Wouverman. The Lord Chancellor.*
  - 5 INTERIOR OF A CHURCH. *Peter Neefs. Skeffington Smith, Esq.*
  - 6 THE PRODIGAL'S RETURN. *Paris Bordone. John C. Lyons, Esq.*
  - 7 PORTRAIT. *Rubens. Earl of Leicester.*
  - 8 INTERIOR OF A GUARD ROOM. *Teniers. Earl of Warwick.*
  - 9 WOODY LANDSCAPE. *Hackaert. The Lord Chancellor.*
  - 10 OUR LORD IN THE HOUSE OF MARTHA AND MARY. *Steenwyck. Earl of Portarlington.*
  - 11 PORTRAIT OF HIMSELF. *Gérard Dow. Earl of Portarlington.*
  - 12 PORTRAIT OF THE ARTIST. *Rembrandt. Earl of Portarlington.*
  - 13 DOG DEVOURING A LIVER AND LIGHTS. *Snyders. Sir Charles Coote, Bart.*
  - 14 BEAR HUNT. *Ridinger. The Lord Chancellor.*
  - 15 LANDSCAPE. *Titian. John C. Lyons, Esq.*
  - 16 A MUSICIAN. *Le Duc. Sir Charles Coote, Bart.*
  - 17 AN OLD MAN WITH GLASS OF LIQUOR IN HIS HAND. *Denner. Lord Anally.*
  - 18 INTERIOR. *Jan Steen. Sir Charles Coote, Bart.*
  - 19 GROUP OF PEASANTS. *Spanish School. Sir Charles Coote, Bart.*
  - 20 RIVER SCENE, DORT. *Cuyp. The Lord Chancellor.*
  - 21 A CONCERT. *Palamedes. The Lord Chancellor.*
  - 22 HEAD OF AN OLD WOMAN. *Denner. Viscount Powerscourt.*
  - 23 PLEASURE GROUNDS. *Moucheron. John C. Lyons, Esq.*
  - 24 HEAD OF AN OLD WOMAN. *Mess. Sir Charles Coote, Bart.*
  - 25 REBECCA AND ISAAC. *Rembrandt. E. Cole, Esq.*
  - 26 FRUIT PIECE. *Snyders. Earl of Portarlington.*
  - 27 SEA PIECE. *Vander Velde. J. S. Macquay, Esq.*
  - 28 THE ESCURIAL. *Unknown. Skeffington Smyth, Esq.*
  - 29 INTERIOR, BOOBS DRINKING. *Brauer. J. H. Reid, Esq.*
  - 30 ADORATION OF THE MAGI. *Breughel. John C. Lyons, Esq.*
  - 31 HEAD OF A COW. *Berghem. Earl of Warwick.*
  - 32 PORTRAIT OF QUEEN HENRIETTA MARIA AND HER DWARF SIR GEOFFREY HUDSON. *Vandyck. Earl of Portarlington.*
- Geoffrey, or Jeffrey, Hudson is often mentioned in anecdotes of Charles I.'s time. His first appearance at court was his being presented in a pie at an entertainment given by the Duke of Buckingham to Charles I. and Henrietta Maria; upon the same occasion, the Duke presented the tenant of the pantry to the queen, who retained him as her page. When about eight years of age he was but eighteen or twenty inches high, and remained stationary at that stature till he was thirty years old, when he grew to the height of three feet nine inches, and then stopped. In 1644 the dwarf attended his royal mistress to France; the Restoration recalled him, with other Royalists, to England; but this poor being, who received hard measure both from nature and fortune, was not doomed to close his days in peace. Poor Geoffrey, upon some suspicion respecting the Popish Plot, was taken up in 1682, and confined in Gate-house prison, Westminster, where he ended his life in the sixty-third year of his age.
- 33 LANDSCAPE, WITH CATTLE. *Cuyp. John Ball, Esq.*
  - 34 THOMAS, EARL OF ARUNDEL. *Rubens. Earl of Warwick.*
  - 35 PORTRAIT OF THE DUKE OF ALVA ON HORSEBACK. *Rubens. Earl of Portarlington.*
  - 36 SADNESS. *Greuze. Sir Charles Coote, Bart.*
  - 37 VILLAGE FESTIVAL. *Teniers. J. S. Macquay, Esq.*

- 38 PORTRAIT OF RYCKHAERT THE PAINTER. *Vandyck. Earl of Warwick.*
- 39 THE EARL OF NEWPORT. *Vandyck. Earl of Portarlington.*
- 40 HOLY FAMILY. *Vandyck. Marquis of Drogheda.*
- 41 BATTLE PIECE. *Unknown. Skeffington Smyth, Esq.*
- 42 PIGS. *Morland. J. H. Reid, Esq.*
- 43 LANDSCAPE, WITH FIGURES. *Breughel. Sir Charles Coote, Bart.*
- 44 RIVER SCENE. *S. Ruysdael.*
- 45 VILLA OF MECÆNAS. *Wilson. National Gallery, London.*
- 46 PORTRAIT OF LAVINIA FENTON, DUCHESS OF BOLTON. *Hogarth. Brinsley Marlay, Esq.*
- 47 RIVER SCENE. *Van Goyen. J. H. Reid, Esq.*
- 48 HEAD OF A CHILD. *Greuze. Sir C. Coote, Bart.*
- 49 LANDSCAPE. *Sir T. Lawrence. Lord de Tabley.*
- 50 THE GATES OF CALAIS. *Hogarth. Earl of Charlemont.*

Soon after the peace of Aix-la-Chapelle, Hogarth went into France, to extend his sphere of observation. His journey was short, and his stay brief. He imagined himself in a land as free as England; began to sketch one of the gates of Calais; was arrested as a spy, and carried before the governor for examination. The offence which he had unwittingly committed was thought serious enough to warrant his immediate transportation to England, and this seems to have been performed in a manner calculated to embitter his feelings. Two guards accompanied him on board, and, after having insolently twisted him round and round on the deck, told him he might proceed on his voyage without further molestation. Hogarth sought to avenge the affront he had received, by a design called "The Roast Beef of Old England." It was recommended to national prejudice by the tempting name, but it cannot be considered as one of his happy works. The scene is laid at the gate of Calais. A French cook appears staggering under an immense piece of roasted beef; a well-fed monk stays him to gaze on it, and seems anxious to bless and cut; and a half-starved meagre community of soldiers surround the reeking wonder with looks ludicrously wistful. Hogarth is seated, busily sketching the scene; and the hand of a Frenchman is laid on his shoulder, denoting his arrest. I have not heard that any Frenchman was hurt by this national satire. An Englishman felt it more acutely. Price the painter sat for the portrait of the friar, and hence acquired the name of Father Price, which he disliked so much that he requested the likeness might be altered.—*Lives of Eminent British Painters, &c., by ALLAN CUNNINGHAM.*

- 51 GROUP OF PORTRAITS. *Sir P. Lely. Sir Charles Coote, Bart.*
- 52 LADY HAMILTON. *Romney. Lord de Tabley.*
- 53 GIRL WITH A DOLL. *Greuze. Sir C. Coote, Bart.*
- 53A THE NATIVITY. *Blake. Sir W. Dilke, Bart.*
- 54 MRS. JORDAN. *Peters. W. Cockburn, Esq.*
- 55 THE LADY'S LAST STAKE. *Hogarth. Earl of Charlemont.*
- 56 LANDSCAPE. *Gainsborough. Sir C. Coote, Bart.*
- 57 EMILY DUCHESS OF LEINSTER. *Sir J. Reynolds. Duke of Leinster.*
- 58 THE STRAWBERRY GIRL. *Sir J. Reynolds. J. Chance, Esq.*
- 59 KITTY FISHER. *Peters. W. Cockburn, Esq.*
- 60 GIPSEY GIRL. *Sir T. Lawrence. Royal Academy, London.*
- 61 PORTRAIT OF LADY CAROLINE DAMER. *A. Kauffman. Earl of Portarlington.*
- 62 LANDSCAPE. *Barrett. Henry Davis, Esq.*
- 63 RIVER SCENE WITH CATTLE—Morning. *Tomkins.*
- 64 PORTRAIT OF THE COUNTESS OF NEWPORT. *Sir P. Lely. Earl of Portarlington.*
- 65 LADY EDWARD FITZGERALD. *Romney. Lady Campbell.*
- 66 FALLS OF LODORÉ (CUMBERLAND). *Roberts. Royal Hibernian Academy.*
- 67 PRIMATE ROBINSON. *Sir J. Reynolds. Dean and Chapter of Armagh.*
- 68 LANDSCAPE. *Louthborough. Sir Charles Coote, Bart.*



- 156 PORTRAIT OF AN OLD LADY. G. Dow. *Knight of Kerry.*  
 157 PORTRAIT OF A YOUNG MAN. Eckhout.  
 158 VILLAGE MUSICIAN. Rembrandt. *Marquis of Drogheda.*  
 159 WOODY LANDSCAPE. Breughel. *Miss Trench.*  
 160 VENUS RISING FROM THE SEA. Barry.  
 161 VIEW OF TIVOLI. G. Poussin. *J. H. Reid, Esq.*  
 162 BOY BLOWING BUBBLES. Mieris. *J. H. Reid, Esq.*  
 163 GARDEN SCENE. Watteau. *J. H. Reid, Esq.*

## MODERN BRITISH SCHOOL.

Large Upper Gallery, off East Corridor and North Corridor.

Very few English artists contributed, on their own account, to this Exhibition. Doubtless they had a good market nearer home; but we think they hardly consulted their reputation in forgetting the claims of the sister country. The great mass of the noticeable pictures were selections from the Royal collection, from South Kensington, the "diploma" pictures of the Royal Academy, and private collections of works already exhibited. To those who had to make acquaintance with these works they would, of course, afford the same pleasure as they had already given to persons familiar with them; and it is agreeable and instructive merely to have an opportunity for verifying former impressions by seeing the pictures again under different circumstances and in a fresh collection.

Her Majesty graciously contributed, among others, the undermentioned works:—"The Penny Wedding" and the "Maid of Saragossa," by Sir David Wilkie; "Portsmouth Harbour," by Stanfield; "The Coronation of Queen Victoria: Receiving the Sacrament," by Lealie; "The Wolf and the Lamb," and a "Cottage Interior," by Mulready; "The Marriage of the Princess Royal," by Philip; Winterhalter's portraits of the Queen and the late Prince Consort; "The Distribution of the Crimean Medals," by G. H. Thomas; and the "Opening of the Exhibition of 1851," by D. Roberts. From the National Gallery (British School), and the Sheepshanks and other donations at South Kensington, there are examples of the following artists:—Sir Edwin Landseer, "The Shepherd's Chief Mourner;" Lealie, "Uncle Toby and the Widow Wadman," and "Sancho Panza and the Duchess;" Mulready, "The Last In" and "First Love," Elmore; MacIise, "Malvolio and the Countess"—there are, as will be seen, several other works by this the greatest of Irish artists; W. Collins, "As Happy as a King;" Turner, "Venice;" E. M. Ward, "Dr. Johnson in the Ante-room of Lord Chesterfield;" Wilkie, "The Parish Beadle;" Herbert, "Sir Thomas More and his Daughter;" &c. The Royal Academy from the "diploma pictures," and the collection of portraits of Royal Academicians in course of formation, sent the following:—"A Forager," MacIise; portrait of Gibson the Sculptor, Boxall; Portrait of Sir Charles Eastlake, Knight; "Song of the Nubian Slave," F. Goodall; "The Village Buffoon," Mulready; "Oliver Cromwell Praying in his Tent," Egg; Macnee's Portrait of the late D. Roberts; and specimens of F. R. Pickersgill, C. W. Cooke, Roberts, and Constable. There were also many celebrated pictures which had previously been exhibited at Trafalgar-square, or elsewhere, of which we may name O'Neill's shipwreck scene, "The Volunteer;" "The Terror in the Ice," by Cooke; "The Funeral of John Hampden," by Calderon; "The Vale of Rest," by Millais; "Noah's Sacrifice," by MacIise; "Burial of a Christian Martyr," by E. Armitage; "Fête de Marriage," by F. Goodall; "The Parting of Lord and Lady William Russell," by Cope; a replica, in oil, of the fresco in the Westminster Palace; Watt's Portrait of Sir John Lawrence, and Holman Hunt's Portrait of Mr. Monck; "The (Dead) Stonebreaker," by H. Wallis; Leighton's large picture

of Dante; "Home from the Sea," by A. Hughes; "The Sea Cave," by Frost; and "Excelsior," by Elmore. There are besides works of consequence by Dyce, J. Linnell, Dobson, M. Anthony, and H. W. Phillips. Of the few pictures of importance not previously exhibited—or, at all events, which we had not before seen—the most commendable are a large and pathetic picture of "The Parting of Charles I. and his Children," by O. Lucy; another historical picture of high aim, "Wycliffe Repulsing the Mendicant Friars," by R. Norbury; and a full-length of Mr. Leighton, by E. Armitage, which, though a little crude and opaque in colour, is distinguished by an originality of treatment out of the ordinary runs of professional portraiture. Lastly, there are several pictures of considerable merit by artists of local reputation, one of which we may mention particularly—*i.e.*, an imaginative representation, by E. Shiel, of "The Angel of Intercession" as a central figure, and numerous separate but subsidiary subjects in the same frame, showing the crimes and sorrows for which the Angel intercedes at the throne of God's mercy.

- 1 EGYPTIAN WATER CARRIER. H. W. Phillips.
- 2 PORTRAIT OF A LADY. M. Cregan.
- 3 STUDY OF A HEAD. H. Weigall.
- 4 PORTRAIT. Catterton Smith, P.R.H.A.
- 5 THE HERMIT. C. Landseer. *Royal Academy.*
- 6 CATTLE ON HILLSIDE. W. Huggins. £70
- 7, 8 THE PHOTOGRAPHIC STUDIO (No. 1 and No. 2). Cook. Each, £50
- 9 THE VOLUNTEER. H. O'Neill.
- 10 THE PENNY WEDDING. Sir D. Wilkie. *Her Majesty the Queen.*
- 11 LANDSCAPE—EVENING. Deschayes. J. Simon-ton, Esq. £7 10s.
- 12 SEA PIECE. J. E. Meadows.
- 13 MAMMA'S BIRTHDAY. W. C. T. Dobson. W. Bowman, Esq.
- 14 INTERIOR OF ST. MARK'S, VENICE. E. Cooke.
- 15 THE MODERN HAGAR. H. W. Phillips.
- 16 PORTSMOUTH HARBOUR. C. Stanfield. *Her Majesty the Queen.*
- 17 SHEEP IN SNOW. T. S. Cooper. *Charles Lang-ton, Esq.*
- 18 OLD WEIR BRIDGE, KILLARNEY. O. M. Latham. £20
- 19 THE SHEPHERD'S CHIEF MOURNER. Sir E. Land-seer. *South Kensington Museum.*
- 20 PHILÆ, Nubia, from the East. F. Dillon.
- 21 ON THE DERWENT, AT GRANGE, BARROWDALE. J. J. Hughes. £10
- 22 UNCLE TOBY AND THE WIDOW WADMAN. C. R. Leslie. *National Gallery.*
- 23 PORTRAIT OF THE DUKE D'AUMALE. G. Sant. *Frances, Countess of Waldegrave.*
- 24 POPPIES AND CANTERBURY BELLS. Miss J. Deffell. £15
- 25 IL SALTARELLO. Buckner.
- 26 THE PORT OF BREST, FRANCE. Parrott.
- 27 CHASTITY. W. E. Frost.
- 28 HER MAJESTY'S SHIP "TERROR" IN THE ICE. E. W. Cooke. *S. Gurney, Esq.*
- 29 ROGER WILLIAMS' FIRST INTERVIEW WITH THE INDIANS. H. Breuckner. *J. Hauser, Esq.* £150
- 30 THE CADI'S COURT, ALGIERA. J. O'Connor. £2
- 31 SCENE ON THE THAMES. G. D. Williams.
- 32 LOW WATER—SEAHAM IN THE DISTANCE. J. P. Bacon. £31 10s
- 33 LANDSCAPE. Lebas. *J. Simon-ton, Esq.* £5 10s
- 34 QUEEN VICTORIA'S CORONATION—RECEIVING THE SACRAMENT. *Her Majesty the Queen.*
- 35 HIS EXCELLENCY THE LORD LIEUTENANT. Cat-terton Smith, P.R.H.A. *Lord Wodehouse.*
- 36 PORTRAIT OF THE LATE FRANCIS JOHNSTON, P.R.H.A. Martin Cregan.
- 37 HOLY ISLAND, Lough Derg. B. C. Watkins. £60
- 38 "TELL YOUR FORTUNE, SIR." H. H. Marten. £25
- 39 ST. PATRICK'S DAY AT DUBLIN CASTLE. M. Angelo Hayes. *Earl of Carlisle.*



- 142 MARRIAGE OF H. R. H. THE PRINCESS ROYAL. J. Phillip. *Her Majesty the Queen*.  
 143 DANTE. F. Leighton.  
 144 THE ALLIED GENERALS BEFORE SEBASTOPOL. Barker. *Gardie Brown, Esq.*  
 145 DOLLY VARDEN. A. A. Hunt.  
 146 AVIGNON. C. Stanfield. *Sir Charles Coote, Bart.*  
 147 PRAYER. J. Phillip. *Royal Academy*.  
 148 SIR THOMAS MORE AND HIS DAUGHTER. J. R. Herbert. *National Gallery*.  
 149A LES FEMMES SAVANTES. C. R. Leslie. *South Kensington Museum*.  
 149 LANDSCAPE. D. Cox. *C. Langton, Esq.*  
 150 GLENDALOUGH. J. Faulkner. *E. Walsh, Esq.*  
 151 STUDY OF COLOUR. Miss A. Dundas. £12  
 152 THE DEPARTURE FROM THE CASTLE. J. Gelder. £12 12s  
 153 COAST SCENE. Deschayes. *J. Simonton, Esq.*  
 154 A SHIP ON FIRE. G. Chambers.  
 155 "LA VENIZIANA." F. Leighton.  
 156 THE LAST IN. W. Mulready. *National Gallery*.  
 156A MOONLIGHT ON THE SCHELDT. T. A. Davis. £10 10s  
 157 WINDOW IN VENICE DURING A FESTA. W. Etty. *National Gallery*.  
 158 OPENING OF THE EXHIBITION OF 1851. D. Roberts. *Her Majesty the Queen*.  
 159 PORTRAIT OF HER MAJESTY THE QUEEN. Winterhalter. *Her Majesty the Queen*.  
 160 CASTLE OF MARKSBERG ON THE RHINE. J. P. Bacon. £105  
 161 THE RECONCILIATION OF SIR JOSHUA REYNOLDS AND GAINSBOROUGH. C. Lucy.

Between Gainsborough and Reynolds there seems to have been little good-will. They at one time appeared desirous of making something like an exchange of portraits; and Gainsborough obtained one sitting of the President, but the piece was never completed. The cold and carefully meted out courtesy of the one little suited with the curious mixture of candour and caprice in the other; and like frost and fire, which some convulsion casts into momentary contact, they jostled, and then retired from each other, never more to meet till Gainsborough summoned Reynolds to his death-bed, and peace was made between them. Gainsborough exclaimed to Sir Joshua, "We are all going to heaven, and Vandyck is of the company," and immediately expired, August 2nd, 1788, in the sixty-first year of his age. Sheridan and the President attended him to the grave.—*Cunningham's Lives of Eminent British Painters*.

- 162 THE MAID OF SARAGOSSA. Sir D. Wilkie. *Her Majesty the Queen*.  
 162A SEA PIECE. E. Cooke. *Sir Charles Coote, Bart.*  
 163 OLIVER CROMWELL PRAYING IN HIS TENT. A. L. Egg. *Royal Academy*.  
 164 ANNE PAGE AND SLENDER. C. R. Leslie. *Lord De Tabley*.  
 165 HOME FROM SEA. A. Hughes. *J. H. Tarit, Esq.*  
 166 DEAD BIRDS. Miss A. Dundas. £20  
 167 "THE ANGEL OF INTERCESSION."—Rev. viii., 3, 4. E. Sheil. *Judge Herwick*.  
 168 PHILIP IV. IN THE STUDIO OF VELASQUEZ. A. Herbert. *Alderman Salomons, M.P.*  
 169 STILL LIFE. W. Duffield. *Viscount Powerscourt*.  
 170 THE SEA SIDE. J. Franklin.  
 171 CATTLE—AN EVENING DRINK. T. S. Cooper. *Viscount Powerscourt*.  
 172 PORTRAIT. G. F. Mulvany.  
 173 PORTRAIT OF LADY CLAUDE HAMILTON. J. Swinton.  
 174 LANDSCAPE AND CATTLE. J. Tennant.  
 175 DOG. J. Ward.  
 176 THE CAPTURED TRUANT. H. Crowley. £30  
 177 IN THE DANGLE. J. R. Faulkner. *E. Walsh*.  
 178 A CONVENT DOOR. C. W. Cope. W. Key, *Esq.*

- 179 PORTRAIT OF HIMSELF. Sir D. Wilkie. £150  
 180 OFF IRELAND'S EYE. J. R. Marquis. £75  
 181 COUNTRY COUSINS. R. Redgrave. *National Gallery*.  
 182 PORTRAIT OF D. ROBERTS, R.A. J. Macnee. *Royal Academy*.  
 183 THE FISHERMAN'S HOME. F. Danby. *National Gallery*.  
 184 PORTRAIT OF SIR J. POWER, Bart., of Kilfinane. H. Grant.  
 185 PORTRAIT OF VISCOUNT MALDEN. J. Swinton.  
 186 DUTCH PRASANTS RETURNING FROM MARKET. Sir A. W. Calcott. *National Gallery*.  
 187 PORTINGROSS CASTLE, Perthshire. A. Perigal. £42  
 188 THE SEA CAVE. W. E. Frost.  
 189 ROSLIN CHAPEL. D. Roberts. *South Kensington Museum*.

The beautiful chapel of Roslin was founded in 1446 by William St. Clair, Prior of Orkney, where he resided in princely splendour, and founded the chapel, which is in the most rich and florid style of Gothic architecture.

"O'er Roslin all that dreary night  
 A wondrous blaze was seen to gleam;  
 'Twas broader than the watch-fire light,  
 And redder than the bright moonbeam.  
 "It glared on Roslin's castled rock,  
 It ruddied all the copse-wood glen;  
 'Twas seen from Dryden's groves of oak,  
 And seen from caverned Hawthornden."

- 190 THE BITTER CUP. S. Anderson. £84  
 191 PORTRAIT OF THE LATE RT. HON. SIR THOMAS WYSE. J. Partridge.  
 192 PORTRAIT OF HER ROYAL HIGHNESS THE PRINCESS OF WALES. H. Weigall. *H. R. H. the Prince of Wales*.  
 193 SANCHE PANZA AND THE DUCHESS. C. R. Leslie. *National Gallery*.  
 194 FLOWERS. Miss Muttie. *E. Cooke, R.A.*  
 195 THE COTTAGE FIRESIDE. J. B. Macdonald. *James A. Aitken, Esq.* £31 10s.  
 196 "OLIVIA." W. H. O'Connor.  
 197 BAALBEQ. D. Roberts. *Royal Academy*.  
 198 SPANISH GIRL AT PRAYERS. J. Phillip.  
 199 PORTRAIT OF THE LATE EARL OF CARLISLE. J. Partridge.  
 200 "EXCELSIOR." A. Elmore.  
 201 THE LOCK. Constable. *Royal Academy*.  
 202 ALLINGTON CASTLE. J. M. W. Turner. *H. J. Chance, Esq.* £300  
 203 A COTTAGE INTERIOR. W. Mulready. *Her Majesty the Queen*.  
 204 HORSES IN STABLE. J. J. Herring. *Sir C. Coote, Bart.*  
 205 PORTRAIT OF T. VAUGHAN, Esq. J. P. Knight. *Royal Academy*.  
 206 PORTRAIT OF THE REV. DR. COOKE. D. M'Nee.  
 207 SCOTCH CATTLE. T. S. Cooper. *Sir C. Coote, Bart.*  
 208 THE ITALIAN MOTHER. T. Uwina. *Royal Academy*.  
 209 THE ARROW OF DELIVERANCE. F. W. W. Topham.  
 210 THE YOUNG MENDICANT'S NOVICIATE. R. Rothwell. *Sir C. Coote, Bart.*  
 211 ARREST OF COLUMBUS ON THE SOIL HE FIRST DISCOVERED. C. A. Duval. £200

Columbus then steered for Hispaniola, and reached the new city of San Domingo. On his arrival he again found the Indians in arms against the Spaniards, who had given them several defeats, under the command of the Admiral's brother, Bartholomew. Several of the settlers mutinied against the authority of Columbus and his brother—a proceeding productive of more injury than all the natives were able to effect.

- 212 CHILDREN RETURNING HOME WITH FUEL. E. Fitzpatrick. £30



(60), by A. Piotrowski (Konigsberg), a demoniacal lantern-light scene, painted with great force; "A Winter Snow-scene" (64), by L. Douzette (Berlin), the glimmer and mystery of the moonshine finely given; and "Sunday" (80), by Siegert (Düsseldorf). There are, besides, an animal-piece by Steffek (65), and many admirable landscapes, principally from Düsseldorf, but by Scandinavian as well as German artists—especially those of Gude, Eschke and Leu.

The Scandinavian schools are fully and well represented, thanks, we understand, to Mr. Elfström, to whose agency we owe the London Exhibitions of Scandinavian painters of the last few years. By Tidemand, the great Norwegian master, there is the picture, exhibited in '62, of the "Haugians" (110), representing the preaching in a Norwegian cottage of one of the sect so called; and another (114), the subject of which is an old Norwegian dame showing, with much pride and ceremony, to the young maidens, her granddaughters, the precious heirloom, her "bridal crown," one of those richly-embroidered tiaras which the poorest Norwegian girl must needs wear at her wedding. There are several sea-pieces by the Swedish artist Sorenson—one of the very best living marine painters, although the examples here differ widely in merit. M<sup>me</sup>. Jerichau, in addition to other works previously exhibited, including a portrait of her husband, the distinguished Danish sculptor, has a meritorious picture, "Little Karen Refuses the Crown offered to her by the King of Sweden, and asks him to leave it to his Queen, and spare her honour" (396). But the best of the Scandinavian pictures, and, indeed, one of the choicest gems of the entire Exhibition, is "The Proposal" (417), by the Swedish artist Fagerlin. The scene is the interior of an humble dwelling occupied by an old fisherman, with his aged partner and daughter, an only child, apparently. A manly, homely-looking young fisherman has proposed for the daughter, and stands respectfully near the door, looking earnestly towards her, while the girl steadfastly and seriously averts her eyes, as if resolved to abide her parents' decision. The worthy old dame, stooping over her gude-man, who is seated, mending his net, in the foreground, deferentially submits to him the young man's proposal. As the deaf old father listens, we read the mixed emotions in the weather-worn face, the humorous *bonhomie*, the parental self-sacrifice, with the sudden pain at thought of losing his darling. In short, the loving loyalty of one and all is most touchingly conveyed by exquisitely felicitous truth in the expressions, and a total freedom from vulgarity or sentimentalism. Another remarkable picture, though not without a certain taint of vulgar primness, is a representation, with many figures (430), of the scene round a gaming table in the Kursaal at Baden-Baden, by the Swedish artist, D'Unker. The style of the painting resembles that of our own Frith. Miss Lundeberg has a pathetic picture of a family of three generations mourning over the dead youngest child, entitled "Baby's Last Cradle" (426). We may also mention "Monks' Employment" (413), by O. Knille; and "Lago di Como," an effective but rather mannered landscape, by E. Bergh (420).

The Spanish pictures are interesting alike for their rarity, the novelty of their grave, sad, tragic, or ascetically religious subjects, and their own proper merit as paintings. Many of them are from the National Museum of Madrid. We may name the following in the upper central hall for special attention, taking the order of the catalogue:—"The body of Beatrice Cenci Exposed on the Bridge of St. Angelo" (173), by L. Vales; "Isabel Dictating her Will" (174), by E. Rosales—a large work of great power and of Velasquez-like character in the handling; "Funeral of St. Cecilia" (178), by L. Madrazo; and "Tasso Retiring to the Convent of St. Onofrio at Rome" (191), by M. Maureta. Also, in the concert room, "The Lovers of Ternel" (486), by J. G. Martinez; "Funeral Convoy of Friar Felix Lope de Vega Carpio passing before the Convent of Nuns of the Trinity at Madrid, wherein was

his Daughter" (491), a large composition of many figures by Ygnacio Llanos. In this dry, sober, and naturalistic but deeply impressive picture of the magnificent funeral of that marvellously prolific Spanish dramatist, the body, attended by the monks of the order which Lope de Vega had joined, and a large concourse of spectators is seen, in its monastic habiliments, exposed in his coffin, and in the hands, folded on the breast, is placed a sacramental chalice. The daughter wrings her hands between the bars of that grille through which alone she may communicate with the outer world. The legendary representation of "The Journey of the Virgin and St. John to Ephesus after the Death of Christ" (495), by G. Hernandez, though hard and positive in colour, is noticeable for the earnest and sorrowful expression of the figures. A much more artistic—perhaps the finest—Spanish picture is "Funeral of St. Lorenzo in the Catacombs of Rome" (496), by A. Vera, totally free from clap-trap, sculptural almost in the dignity of the persecuted Christians, who look on the corpse of the martyred saint with more of faith and hope than sorrow; broad and simple in treatment, sober yet beautiful in colour.

The only pictures from Italy we need mention are the "Head of a Ciciara," by G. Müller, a German artist at Rome; and two pictures sent by the city and corporation of Naples:—"A Rigorous Examination: Scene during the Inquisition" (160), by G. Tomo—a poor bleeding wretch stretched on the rack on the pavement of some ecclesiastical building, a priest putting the questions from a paper, and other priests closely confabulating in horrible indifference to the sufferings of their victims; and "Plautus as a Miller, Reading one of his Comedies" to his floury fellow miller men in the mill-house (166), by C. Miola.

## FRENCH SCHOOL.

### Upper Central Hall.

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|---|-----------|
| 1 LADY AND PARROT. Bolanges (Brussels). H. A. Payne, Esq.   | £35       |
| 2 OPHELIA. L. Janmot.   | £80       |
| 3 VADRI AT THE HALLE IN PARIS. A. Monfallet.  | 52        |
| 4 HIDE AND SEEK. T. E. Duverger.  | £157 10s. |
| 4A PRAYER. T. E. Duverger. R. Gambart, Esq.   | £31 10s.  |
| 5 TEMPLE OF HERMONTIS, Upper Egypt. N. Berchere. C. A. Dural, Esq.  | £250      |
| 6 HORSES DRIVEN TO WATER. A. Schreyer. R. Gambart, Esq.   | £315      |
| 7 A MONK. Mlle. Henriette Brown.  |           |
| 8 BANKS OF THE VEULSE, Normandy. E. Lambinet.   | £300      |
| 9 THE WIDOW'S MITE. E. Dubufe.  |           |
| 10 THE ORPHAN. C. Compto. H. A. Payne, Esq.   | £126      |
| 11 THE EMPTY CRADLE, and 12 WOMEN OF BERRY COUNTING THEIR BEADS. E. Boilly.   | each £12  |
| 13 BLIND CECILIA WHILST CONDUCTING THE CHRISTIANS IN THE CATACOMBS IS STOPPED BY THE SOLDIERS OF THE EMPEROR MAXIMUS. Mlle. L. Vautier. | £32       |
| 14 PORTRAIT OF A DOG. Mlle. Rosa Bonheur.   |           |
| 15 VOLUNTEERS AT ECOUEN. E. Frère. R. Gambart, Esq.   | £535      |
| 16 CHRIST BEARING HIS CROSS. L. Janmot.   | £40       |
| 17 THE CHESS PLAYERS. After Meissonier.   | £5        |
| 18 A GREEK GIRL. H. Schlesinger. R. Gambart, Esq.   | £126      |
| 19 PENSEROSA. L. Janmot.  | £28       |
| 19A LE PERE LACORDAIRE. L. Janmot.  |           |

## GERMAN SCHOOL.

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| 19B THE WIDOW. L. Neustatter, Munich.                    | £30  |
| 20 THE ISLAND OF CAPRI BY MOONLIGHT. T. Andrews, Munich. | £100 |



- 54 MOTHER AND CHILD. Gliemann, Saxony. £45  
 55 THE EMPEROR HENRY IV. DOING PENANCE IN THE COURT AND CASTLE OF CANOSSA—January, 1077. H. Plüddemann, Saxony. £180

The predecessors of Henry IV., Emperor of Germany, as well as other princes of Christendom, had the right of nominating bishops and abbots, and of giving them investiture by the ring and crosier. The popes had been accustomed, on their part, to send legates to the emperors to entreat their assistance, to obtain their confirmation, or desire them to come and receive the papal sanction, but for no other purpose. Gregory, however, sent two legates to summon Henry to appear before him as a delinquent, because he still continued to bestow investiture, notwithstanding the apostolic decree to the contrary; adding that, if he should fail to yield obedience to the Church, he must expect to be excommunicated and dethroned. The sentence of excommunication having been fulminated against the emperor and his adherents, the Saxons, Henry's old enemies, made use of the papal displeasure as a pretence for rebelling against him. Even his favourite Guelf, a nobleman to whom he had given the duchy of Bavaria, supported the malcontents with that power which he owed to his sovereign's bounty; and the very princes and prelates who had assisted in deposing Gregory gave up their monarch to be tried by the Pope, who was requested to come to Augsburg for that purpose. Willing to prevent this trial at Augsburg, Henry took the resolution of suddenly passing the Tyrolean Alps, accompanied only by a few domestics, in order to ask absolution of Gregory, who was then in Canossa, on the Apennines, a fortress belonging to the Countess, or Duchess Matilda. At the gates of this palace the Emperor presented himself as an humble penitent. He alone was admitted within the outer court, where, being stripped of his robes, and wrapped in sackcloth, he was obliged to remain three days, in the month of January (A. D. 1077), barefooted and fasting, before he was permitted to kiss the feet of the Pope.—RUSSELL'S *Modern Europe*.

- 56 THE EMPEROR FREDERICK BARBAROSSA CALMING THE QUARREL BETWEEN THE PRINCES AND THE PAPAL LEGATES, AT THE MEETING OF THE IMPERIAL DIET IN BESANCON, 1157. H. Plüddemann, Saxony. *H. M. the King of Saxony*.

Frederick Barbarossa was, on the death of Conrad III., unanimously chosen Emperor of Germany in the year 1152. After settling the affairs of Germany, he marched into Italy in 1155, in order to compose the disturbances of that country, and to be crowned by the Pope, in imitation of his predecessors. Adrian IV., who then filled St. Peter's Chair, was inclined to crown a vassal, but afraid of giving himself a master; he therefore insisted upon the Roman ceremonial, which required that the emperor should prostrate himself before the pope, kiss his feet, hold his stirrup, and lead his white palfrey by the bridle the distance of nine Roman paces. Frederick looked upon the whole ceremony as an insult, and refused to submit to it; however, he at length submitted to these affronts as empty marks of Christian humility, though the court of Rome viewed them as proofs of real subjection. But the emperor's difficulties were not yet over. The citizens of Rome sent him a deputation, demanding the restoration of their ancient form of government, and offering to stipulate with him for the imperial dignity. "Charlemagne and Otho conquered you by their valour," replied Frederick, "and I am your master by right of succession: it is my business to prescribe laws, and yours to receive them."

- 57 VIEW OF DÜNGOLA AGURE, NUBIA—SUNSET. O. Georgi, Saxony. £18  
 58 GERMAN LANDSCAPE. A. Flamm, Düsseldorf. £70  
 59 LANDSCAPE WITH CATTLE. Van Spry, Düsseldorf. £35  
 60 THE COMMISSIONERS OF THE CONVENTION NATIONALE COME TO TAKE AWAY THE DAUPHIN FROM MARIA ANTOINETTE IN THE TEMPLE PRISON. A. Piotrowski, Königsberg. £380  
 61 THE CHILD'S BATH. J. Grün, Berlin. £70  
 62 ON THE PASTURES IN NORMANDY. E. Ockel, Berlin. £50  
 63 WOOD LANDSCAPE. Bennewitz Von Loefen, Berlin. £15

- 64 MOONSHINE—WINTER. L. Douzette, Berlin. £50  
 65 STEEPLE CHASE. C. Steffek, Berlin. £300  
 66 WATCHTOWER OF L'ETAOQ, Jersey. H. Eschke, Berlin. £40  
 67 IN THE WOOD. E. Ockel, Berlin. £50  
 68 THE HUNTER'S REST. A. Kornek, Berlin. £40  
 69 ST. CECILIA. O. Heyden, Berlin. £120  
 70 LADY ON HORSEBACK. C. Steffek, Berlin. £50  
 71 AFTER THE STORM. H. Eschke, Berlin. £40  
 72 THEATRE OF TAORMINA. C. Seiffert, Berlin. £40  
 73 THE CARD-HOUSE. H. Kretzschmer, Berlin. £65  
 74 GENRE PICTURE. T. Krst, Düsseldorf. £20  
 75 POSTILLON D'AMOUR. £15. 76 THE TENANT AND HIS FRIENDS. £40. C. J. Arnold, Berlin.  
 77 THE JUNG FRAU, in the mountains of Berne. E. Von Raven, Düsseldorf. £80  
 78 ITALIAN LANDSCAPE. H. Flamm, Düsseldorf. £100  
 79 STREET SCENE. O. Heyden, Berlin. £50  
 80 SUNDAY. H. Siegert, Düsseldorf. £85  
 81 ON THE SHORE OF CAPRI. A. Leu, Düsseldorf. £180  
 82 LOWER LAKE OF KILLARNEY, from Muckross landing. Lewis, Düsseldorf. £50  
 83 LANDSCAPE. Hengsbach, Düsseldorf. £70  
 84 OAK FOREST—Winter Landscape. L. Scheins, Düsseldorf. £44  
 85 A RUIN ON THE LAKE. H. Pohle, Düsseldorf. £60  
 86 THE FORGERS. C. Litschauer, Düsseldorf. £140  
 87 EVENING ON THE HEATH. H. Steinicke, Düsseldorf. £100  
 88 NORWEGIAN HIGHLANDS. H. Gude, Düsseldorf. £200  
 89 SHAKESPEARE'S CLIFF AT DOVER. H. Eschke, Berlin. £40

"Edg. Come on, Sir; here's the place:—stand still.—How fearful

And dizzy 'tis, to cast one's eyes so low!  
 The crows, and choughs, that wing the midway air,  
 Show scarce so gross as beetles. Half way down  
 Hangs one that gathers samphire; dreadful trade!  
 Methinks, he seems no bigger than his head:  
 The fishermen, that walk upon the beach,  
 Appear like mice; and yon' tall anchoring bark,  
 Diminish'd to her cock; her cock, a buoy  
 Almost too small for sight. The murmuring surge,  
 That on the unnumber'd idle pebbles chafes,  
 Cannot be heard so high:—I'll look no more,  
 Lest my brain turn, and the deficient sight  
 Topple down headlong."

*King Lear. Act V., Scene 6.*

- 90 THE SOGNE FIORD—Norway. A. Leu, Düsseldorf. £180  
 91 ON THE LAKE OF GENEVA. W. Portmann, Düsseldorf. £65  
 92 EVENING UNDER THE PINES OF ALBANO. F. Bellermann, Berlin. £40  
 93 THE GLARNISCH MOUNTAIN—Early morn. W. Schencher, Munich. £40  
 94 WEDDING DAY IN THE BLACK FOREST. F. Geertz, Düsseldorf. £100  
 95 ITALIAN MONK. F. Fay, Düsseldorf. £45  
 96 THE ASSUMPTION. P. Molitor, Düsseldorf. £20  
 97 MONT BLANC AND THE VALLEY OF CHAMOUNIX. F. W. Schreiner, Düsseldorf. £60  
 98 NORWEGIAN LANDSCAPE. F. Duntze, Düsseldorf. £60  
 99 LANDSCAPE, NEAR SORRENTO. C. Jungheim, Düsseldorf. £56  
 100 VIEW IN THE BAVARIAN ALPS. R. Jonas, Berlin. £50  
 101 FRATERNAL ASSISTANCE. F. Boser, Düsseldorf. £60

This picture arrests the eye disposed to skim over the numerous academic, or more or less artificial, works surrounding it, by virtue of its fine tone, perfect naturalness, and a certain spirit and freshness rather unusual among foreign pictures. Nothing can be more simply natural or



141 THE CARDINALS OF SORRENTO AND VOLTERRA SENT BY POPE JULIUS II. AS LEGATES TO CESAR BORGIA, WHEN IN RETIREMENT AT OSTIA, AFTER THE DEATH OF ALEXANDER VI. A. Guerra. £128

142 CUPID AVENGING THE DEATH OF ADONIS. C. de Rossi. £50

143 ITALIAN LANDSCAPE, WITH FIGURES. A. Vertumi. £80

144 THE VESTITURE OF A NUN IN A CHURCH AT ROME. G. Wider. £280

145 RUINS OF THE TOMB OF VIRGIL AT POSILIPO, £40; and 146 THE TOWER OF ASTURA AND FISHPONDS OF LUCULLUS (Sunset). A. Vertumi. £70

147 FALL OF THE VELINO, near Terni; and 148 LANDSCAPE, WITH FIGURES. A. Porcelli. *Marchese Ricci*.

149 WOMAN WITH FLOWER, half length. G. de Sanctis. £80

150 BRIGAND CHIEF. G. de Sanctis. *Sir George Hudson, Bart.*

151 FRUIT. G. Farrell. £5

152 MEN DRINKING IN A CELLAR. A. Porcelli. *Marchese Ricci*. £44

152A PIAZZA OF ST. PETER'S, at Rome. B. Borzetti. £20

## ITALIAN SCHOOL.

Upper Central Hall.

153 A BATHER. Gaetano Chierici, Reggio, in the Emilia. £24

154 THE AQUEDUCT OF CLAUDIUS, outside the Gate of St. John, Rome. Federico Cortese, Naples. £52

155 FAUST AND MARGUERITE. Bartolomeo Guiliano. *Ministry of Agriculture, Industry, and Commerce*.

156 LANDSCAPE IN CAMPAGNA ROMANA. Cav. E. Borgia Cumbo, Messina.

157 LANDSCAPE SCENERY IN THE HILLS OF TURIN.—Edoardo Perotti, Turin. £40

158 RUINS OF THE ROMAN AQUEDUCT IN THE VALLEY OF TIVOLI, near Rome. Prof. A. Prampolini. £80

159 THE TRAIN OF BACCHUS. Cav. F. Gonin, Turin. £240

160 A RIGOROUS EXAMINATION—SCENE DURING THE INQUISITION. Giochino Tomo. *City and Corporation of Naples*.

161 OUTPOST OF THE FIRST 200 GARIBALDIANS IN CALABRIA. Luigi Toro, Naples. £120

162 THE MONUMENT OF KING STANISLAUS IN THE CHURCH OF S. GIOVANNI, at Carbonari, Naples. Giovanni Lanza, Naples. £40

163 ENTRANCE TO THE VILLA D'ESTE, Tivoli. Prof. A. Prampolini. £14

164 HEAD OF AN OLD WOMAN IN VENETIAN COSTUME. Raffaele Genovese, Palermo.

165 GARIBALDI IN ROME. D. Russo. Naples. £400

166 PLAUTUS AS A MILLER, READING ONE OF HIS COMEDIES. Camillo Miola. *City and Corporation of Naples*.

167 TWO GARIBALDIAN GUIDES IN CALABRIA. Luigi Toro, Naples. £120

168 OTHELLO AND DESDEMONA. Cav. C. F. Biscarra, Turin. £40

169 AN EPISODE IN THE ITALIAN WAR IN 1859, at Palestro. Guglielmo Castoldi, Milan. *Ministry of Foreign Affairs*.

170 THE MONK'S FIREPLACE, £20; and 171 A STORM. Prof. A. Chierici. £20

173A ISOLA DEI PENCATORI, taken from Isola Bella, Borromean Islands, on the Lago Maggiore. Luigi Ashton, Milan.—(See also 379, p. 511.) £20

205 CRAZY LINDA OF CHAMOUNIX. Giuseppe Giani, Turin. £40

"No, non è ver, mentirono,  
Tradir tu non my puoi,  
È solo per me palpita  
Fedele il tuo bel cuor."—DONIZETTI.

The following pictures were not numbered:—

ISOLA BELLA, taken from Stresa, Borromean Islands, on the Lago Maggiore. Luigi Ashton, Milan. £32

THE LAKE OF CANDIA, near Ivrea, Turin. Chev. Giuseppe Camino, Turin. *Ministry of Public Works*.

LANDSCAPE, near Oliveto, in Tuscany. Scipione Carignano, Turin. *The Ministry of Foreign Affairs*.

THE BELLE OF CINO OF PISTOJA. Leonardo Gasser, Florence. *Ministry of the Interior*.

PANORAMIC VIEW OF FLORENCE. Lorenzo Gelati, Florence. £20

THE SECRET DOOR. Chev. Guido Gonin, Turin. *The Marquis Giuseppe Arconati Visconti, Turin*.

MARY MAGDALEN AT THE TOMB. Sarah Butler Handcock, Pisa.

THE GARIBALDIAN SENTINEL (Crimean War). Girolamo Induno, Milan. *Ministry of the Interior*.

BATTLE OF S. FERMO, near Como, under Garibaldi, 29th May, 1859. Angelo Trezzini. *Ministry of Public Works*.

HAWKING IN THE NEIGHBOURHOOD OF LAKE URUMIAH, Armenia. Chev. Alberto Pasini, Paris. *Minister of Agriculture, Industry, and Commerce*.

VENUS APPROACHING THE CITY OF TROY. William Stark, Florence. £700

(See also Nos. 458 to 467, and 471 to 487.)

## SPANISH SCHOOL.

Upper Central Hall.

171A THE ORPHAN'S SORROW. M. G. Hispaleto. £126

172 THE SORRENTO WOMAN. M. Benito Soriano. £60

173 THE BODY OF BEATRICE CENCI EXPOSED ON THE BRIDGE OF SAN ANGELO (Manuscript in the Vatican). L. Vales. *Nat. Museum, Madrid*.

173B THE COASTS OF SPAIN AND AFRICA, from the Bay of Gibraltar. M. de la Roca.

173C STILL LIFE. J. Estrada.

173D STILL LIFE. J. Mirabent.

173E MENDICANT MONKS. C. Lamacois.

173F A MUSICIAN. J. G. Bande.

173G A NEAPOLITAN. M. de la Roca.

174 ISABELL THE CATHOLIC DICTATING HER WILL. E. Rosales. *Nat. Mus., Madrid*. *Prescott's History of Ferdinand and Isabella* (See 189).

Isabella, the daughter of John II. of Castile, passed the early part of her life in obscurity and indigence; but the Castilians, exasperated against her brother Henry IV. an ill advised and vicious prince, upon his demise rejected his daughter Joanna, and placed Isabella on the throne of Castile. She married Ferdinand King of Arragon. . . . The untimely death of her children had made a deep impression on the mind of the Queen, and she derived but little consolation for the loss she had sustained either from her daughter Joanna, whose infirmities daily increased, or from her son-in-law Philip; her health began gradually to decline, and, after languishing some months, she died at Medina del Campo, on the 26th of November, 1504.

175 LANDSCAPE. M. Rico. £40

176 A BEGGAR AND CHILD. D. Fierros. £80

177 ANCIENT HALL OF THE CORTES OF THE KINGDOM OF VALENCIA. P. Gonsalvo. *The Duke of Fernan Nunez*.

178 FUNERAL OF ST. CECILIA. L. Madrizzo. *Nat. Museum, Madrid*.

179 HARE WITH DUCK AND OTHER BIRDS. J. Serra. *Nat. Museum, Madrid*.

180 YESTERDAY AND TO-DAY. C. Pizarro. *Nat. Museum, Madrid*.

181 THE CONFESSION. V. Mazano. £60

182 PHILIP III. OF FRANCE BLESSING HIS CHILDREN ON HIS DEATHBED (Catalan Chronicle of Roman Montaner). Manuel Ferran. *Nat. Museum, Madrid*.

Philip III. of France reigned from 1270 to 1285. He was the son of the pious Louis IX., surnamed St. Louis. During Philip's reign occurred the Sicilian Vespers, and the war between France and Arragon. After the flight of St. Louis's brother Charles of Anjou, from Naples and Sicily, Peter,



hope. In the peaceful pursuit of the arts, as in war, fortune favours the brave; so, nothing daunted by the difficulties I had to contend against, I set heartily to work to do the best I could for the friends of Ireland who had pressed me into their service to visit Northern Europe in the interest of the intended International Exhibition. The great Exhibition of London in 1851, that of Paris in 1855, and of London again in 1862, with the minor, but not less enterprising, Exhibition in Dublin in 1853, have done so much for progress and civilization that they may well be termed, as they have truly proved themselves, the great civilizers of modern times. Though not an Irishman by birth, I have many esteemed and valued friends in that, our sister, island; and I shall ever remember my visits to the "Emerald Isle" as amongst the happiest days I have ever spent. To me it appears that Ireland possesses all the elements of wealth. Her situation for commerce is admirable—her soil most prolific—her climate most delightful—her people are, perhaps, as brave, generous and free, as any on this earth; then why should they not be as prosperous and happy as any other people? They have produced as great orators, statesmen, warriors, divines, poets, &c., as any other nation; and in my later visits to the Land of the Free, "That first flower of the earth and first gem of the sea," I have witnessed the marvellous progress that has been made, in my remembrance, in the physical condition of her labouring people; and since it is righteousness that exalteth a nation—so we have learned in our schools that *ingenuas didicisse fideliter artes, emollit mores nec sinit esse feros*—may the fruits of the labours of her Dargan and her Guinness be blest to still greater progress in the arts of peace and all that can make a nation happy!

All those who have had anything to do with an enterprise of the magnitude of an International Exhibition will know the time, the labour, the talent, the patience, the perseverance, necessary to achieve anything like a satisfactory result even under favourable circumstances; but when, as it were, at the last moment the products of the nations are proposed to be gathered at short notice for such a city as Dublin, which, from adverse circumstances, has come to be considered by foreigners as the capital of a country on the outskirts of civilization, and always in a state of chronic insurrection, the task would have seemed to some almost hopeless. However nothing seemed impossible to those friends of "Old Ireland" who set this enterprise on foot. I well remember all the pros and cons, and consultations, and invitations, and solicitations necessary before even the preliminary arrangements for the London Committee of Advice could be arranged. This once accomplished, the Committee held their meetings in that cradle of Exhibitions, the London Society of Arts, presided over, for so many years, by the late lamented Prince Consort, and since his decease by his son, our beloved heir-apparent. May he ever walk in the footsteps of his exalted father, the Patron of Art and the lover of Peace.

Having attended nearly, if not all, the meetings of that Committee, I was aware of the difficulties to be encountered. I had heard of the preliminary journeys of Mr. Hercules Macdonnell, of Mr. Mulvany, and the labours of Mr. Philip Owen on the Continent, and the wild cry that Dublin was not Paris or London; that all the nations were reserving their strength for the Great International Congress to be held at Paris in 1867; likewise, that in reply to the circulars to the Northern Courts, sent through our Foreign Office, small hopes of encouragement had been given. I knew that refusals had been in many instances received, and that in others the Governments had advised their subjects not even to entertain the project. I knew, moreover, that many nations had so little self-dependence that unless their Governments undertook all the labour, risk, and expense they would not contribute. The Belfast riots added their quota to the general gloom of the prospect, and the dismemberment of the little kingdom of Denmark by the over-powering legions of the German Confederation, made any prospect of success in that quarter more hopeless than in any other. In fact, when I arrived in Copenhagen the distress caused by the war was at its height, and the country was even then occupied by the armies of the invaders.

Nevertheless, in spite of these discouraging prospects, I was induced to spend my Summer holiday by going to try to give a more favourable impression of the prospects of the intended Exhibition, and a true account of the state of Ireland. I called on the Embassies of the several countries which I was about to visit. One absolutely ridiculed the idea of a Dublin International Exhibition; another smiled a look of incredulity, and explained that so soon after the grand display in London and so soon before the expected gathering in Paris in 1867, nothing could be expected. But one glorious exception I must chronicle—the Danish Minister, Count de Bille, not only received me kindly, but gave me letters to all the leading artists and sculptors in Denmark; also to his friend Consul-General Westenholtz, to whose good offices I was also deeply indebted for much friendly counsel and sound advice, and for many letters of introduction. My good friend, Mr. Philip Owen, also furnished me with letters to his relations in Copenhagen, and to many friends in Norway and Sweden, whom he had known in connexion with the last London Exhibition. The Executive Committee also gave me copies of Lord Russell's Circular to the Foreign Embassies recommending the enterprise; and after innumerable consultations I



"Copenhagen, 1st Nov., 1864.

"MAY IT PLEASE YOUR EXCELLENCY,

"Through your good offices I have had the opportunity of submitting to His Danish Majesty's Government the views of the Committee of the proposed International Exhibition as regards Denmark, and it has been suggested that it would be convenient if I would make a formal application through your Excellency for any help that it may be in the power of the Government here to give.

"I have made several suggestions verbally, and explained the great desire of the Executive Committee to show the love of the British people for their Princess, by doing all they can to have Denmark well represented at the approaching Exhibition. It is proposed to have a Danish Court in which, when the Princess enters, she shall find reminiscences of all that she loves in Denmark; but without the help of His Majesty and his Government this will be impossible; with it, all will be easy.

"I hope I have suggested a way in which help can be given without much (if any) additional cost. I have simply asked the loan of art treasures, antiquities, &c., which the Committee will insure against risks of fire and sea. For the appointment of a committee (or one officer) to make local arrangements, and for the use of a store for the reception of goods prior to shipment.

"The transport of goods appears to me the great difficulty; but if (as I hope) it should be consistent with the views of the Government to allow their conveyance in a vessel belonging to the State, all else will be easily arranged; failing this, I am only authorized to pay the expenses of transit for works relating to the fine arts. I trust your Excellency will do me the favour to submit this to the proper authorities, and acquaint me with the result.

"I have the honour to be,

"Your Excellency's most obedient and very humble Servant,

"ANTONIO BRADY,

"Commissioner for Denmark.

"His Excellency Sir A. Paget, K.G., Minister Plenipotentiary

"and Envoy Extraordinary, &c., &c., &c."

This letter Sir Augustus forwarded the same day to the Minister for Foreign Affairs; and when I had the honour of an interview with his Majesty I found it had been fully considered. All that could be said was that in the then present state of the kingdom it was doubtful whether the Government could do anything; but that the affair should be recommended to Parliament as a matter most useful and interesting to commerce and industry. My interview with his Majesty was of a most touching character; he felt much interested in the object of my visit, and especially appeared pleased with what I said of the anxiety of the British nation to show sympathy with Denmark by love and attachment to their beloved Princess, his daughter.

Some time after I arrived in London, I received the following official reply to my letter:—

"Copenhagen, 32, Norrevald, 18th Novbr., 1864.

"DEAR SIR,

"Yesterday I had a conference with His Excellency Mons. Tillisch, Minister of the Interior, regarding the International Exhibition in Dublin.

"During your stay in Copenhagen you stated that the Executive Committee in Dublin wished to see exhibited, from Denmark, works of fine arts, ethnographic objects, antiquities, and products from our porcelain manufactures. A committee, which will eventually be appointed by the Danish Government, will certainly do the best possible in order to procure a good representation from Denmark of these articles.

"Since you left Copenhagen it has been suggested to obtain a war steamer for the transport of goods; but the marine budget making no provision for this purpose, there is very little probability for the conveyance of goods to the Exhibition in this way.

"From the side of the artists and the owners of art treasures, &c., there will probably be requested one man to be sent over for the arrangement, and one will be necessary for attendance during the Exhibition on all the objects; further, the transport here, packing, packages, means to protect against dust, &c., will give occasion to the expenditure of a sum of money.

"The Minister of the Interior is very willing to propose to our Parliament (*Rigsdag*) an allowance for these disbursements; but in the present state of our country, as reductions in many directions will be necessary, it is doubtful if the Parliament will agree to it; and as the *Rigsdag*, whose consent is necessary, will not be assembled before January next, a Danish Committee will not be able to do anything before that time, except in works of fine arts, for which you, by your letter of the 1st of this month, have agreed to pay the expenses of transport and insurance against risk by fire and sea.

"His Excellency has, therefore, requested me to write to you, and to beg you to favour him with an answer as soon as possible regarding the question, that, if it should not be possible to obtain an allowance from the State, or no sufficient allowance, the Executive Committee in Dublin in this case would grant us all the expenses occasioned by the Exhibition, or that sum of expenses which the Danish Government cannot overcome; and also undertake the responsibility for losses, damages, &c.

"This will, so far as I can understand, be in accordance with the information regarding our present state in reference to the Exhibition, which has been given on the part of the Minister for Foreign Affairs during your stay here. As soon as you will favour me with a good answer to this communication there will be taken, on the part of the Government, a resolution respecting the nomination of a committee in Copenhagen.

"If you should not have sufficient power to decide the question I beg you to refer it to the Executive Committee in Dublin.

"Antonio Brady, Esq."

"I am, Sir, yours truly,

"G. HUMMEL.

"Copenhagen, le 18 Février, 1865.

"M. LE CHEVALIER,

"Aussitôt la réception de la lettre que sous la date du 1<sup>er</sup> Novembre de l'année passée, vous m'avez fait l'honneur de m'adresser au sujet de la participation éventuelle du Danemark à l'Exposition Internationale projetée à Dublin dans le courant de la présente année, j'ai soumis l'annexe de votre susdite lettre à mon collègue pour l'Intérieur du ressort du quel se trouve la matière en question.

"M. de Tillisch vient de me répondre qu'à la suite des démarches qu'il a de son côté faites auprès des Ministres de l'Instruction Publique, et de la Marine pour s'assurer leurs concours dans le sens voulu, il a dû abandonner tout espoir à pouvoir venir au devant du désir de M. Brady, vu que les directeurs de nos collections d'objets d'arts et d'antiquités ne se montrent point disposés à prendre part à la dite Exposition, et que les frais de transport sur un Vaisseau de l'Etat des objets qu'il pourrait être question d'exposer seraient trop considérables.

"Par conséquent le Roi, mon Auguste Souverain, a très-gracieusement daigné arrêter que le Danemark ne participera pas à l'Exposition de Dublin.

"En portant ce qui précède à votre connaissance, je saisis, &c.

"À Sir A. Paget, K.C.B."

"(Signé), BLUHME.

It was clear that, with every desire to help, the state of the country, owing to the disastrous war, precluded the possibility. I, therefore, was obliged to trust to our own resources; and here I must again refer to the services of my friend Mr. Turner, the Consul. He made all the after arrangements, and the collection of fine arts sent, best attests the value of his labours. Messrs. Bing, the china manufacturers, at first were very warm in desiring space to be reserved for them. They had profited so greatly by former Exhibitions (even while I was at their show-room orders for duplicates of articles exhibited in 1862 were received), that it is unaccountable why they withdrew. The goldsmiths refused, in like manner, as did all other trades; and, strangest of all, I found the same difficulty with the artists. The same objections were raised that I had to combat in Norway and Sweden, and one artist wanted to know what security I could give that if he sent one of his pictures it should be sold. I told him if he would repeat the view of Copenhagen I had seen of his, I would guarantee its being sold—in fact, that I would buy it myself at the price he named—he then promised to paint it, and send it for exhibition. But even this poor, though clever, artist, did not keep his engagement, and I did not get the picture till long after the Exhibition was closed, so he got no benefit by its exhibition. When will these foreigners learn self-reliance, and not depend on their Governments doing all for them. Had the Government taken charge of all the arrangements, doubtless he and many others would have had pictures in plenty ready in time; but even he was better than some, who failed in their promises altogether! The artist who entered most warmly into the scheme was Madame Jerichau. She is the wife of the celebrated sculptor. He was engaged on several important works, but he had none that he could finish in time for the Exhibition. They invited a very pleasant company to meet me at their house, amongst them the Danish poet Andersen. He recited many of his beautiful verses, to the admiration of those present, who could understand them; but they were in Danish, and I did not, so I played with Madame Jerichau's beautiful children—and I hope the poet understood the reason. I was pleased to be at a Danish family dinner party, as I was interested to see "ye manners and customs of ye people." It was a charming party, at a large round table. I sat next the mistress of the house; but I made a hole in my manners by not knowing the Danish fashion of carving the fine boiled goose at the head of the table. I was at once relieved of the carving-knife, and was not allowed to help myself or others. I have heard of a boiled pig, but never before saw a *boiled* goose. My father had a very good story of a poor hen-pecked man, who used to brag that he was Cæsar in his own house, and who when told that he dare not ask his friends to dinner on boiled pig, to show that he was Cæsar, was tempted to do so. All went pleasantly till the guests had departed, when a breeze sprung up, and the better-half was heard, by the guests who were listening at the window, to say, "I'll teach you to be Cæsar, I will;" when the wags, who had been listening, cried out, "Good night, Cæsar," to the dismay of the loving couple. This story has been made the burden of a song, which, perhaps, many of my readers may have heard.

I shall long entertain a very lively recollection of the pleasant dinner at the Jerichaus, and of their hospitable entertainment. She sent, I believe, six paintings to the Exhibition, and there are few lady artists her equal. Her works are well known in England, Germany, and France, and are of very great merit. I fear the prices, however, were too high for Dublin.

## SCANDINAVIAN SCHOOL.

(See also Nos. 110–116, and 367 to 444.)

208 THE FOUNDLINGS—My father and my mother forsake me, but the Lord keeps me up. Madame Jerichau. £130

210 EAGLE AND YOUNG CROSS-FOX—Midnight effect of the Sun. F. Rœ. £65

211 NORWEGIAN HIGHLAND SCENE. J. Nilseth, Norway. £50

212 NORWEGIAN LANDSCAPE. A. Askevold.

213 STORM ON THE NORTH SEA. F. Sørensen. £250

214 WHIRLWIND IN THE BLACK SEA. Bennetter.

214A LANDSCAPE IN SWITZERLAND. J. Billing. £33

214B ROBIN GOODFELLOW. Plageman. £30

215 LANDSCAPE WITH ELKS. Nordgren. £150

216 SWEDISH WINTER LANDSCAPE. M. Larsen. £125

217 WATERFALL OF TELEMARKE, Norway. N. Møller. £120

218 NORWEGIAN LANDSCAPE. Bagge. £90

219 SUNSET, MARDANGER, Norway. N. Møller. £70

220 NORWEGIAN MOUNTAIN SCENERY—Sunset. M. Larsen. £125

- 221 NORWEGIAN ALPS. N. Möller. £300  
 222 CATTLE GOING TO PASTURAGE IN THE NORWEGIAN MOUNTAINS. A. Askevold.  
 223 INTERIOR—Norway. Bergslien.  
 224 A VALKYRIA, OR SCANDINAVIAN GODDESS OF WAR. Arbo.

"FRITHIOF'S TEMPTATION."

Soe, the queen of the chase advances! Frithiof, gaze not on the sight!  
 Like a star upon a spring-cloud sits she on her palfrey white;  
 Half of Freya,\* half of Rota,† yet more beautiful than these two,  
 And from her light hat of purple waves aloft the feather blue.

"Now the huntsman's band is ready. Hurrah! over hill and dale!  
 Horns ring, and the hawks right upward to the hall of Odin sail.  
 All the dwellers of the forest seek in fear their cavern homes,  
 But, with spear outstretched before her, after them Valkyria‡ comes."

*Poets and Poetry of Europe, by H. W. LONGFELLOW.*

- 225 WRESTLING MATCH AT INTERLAKEN, Switzerland. H. Herzog. £260  
 226 GRANDMOTHER'S LESSON. J. Müller.  
 227 GERMAN LANDSCAPE. A. Flamm, Düsseldorf. £50  
 228 CHRISTIANIAFIORD, Norway. Collett. £20  
 229 OTHELLO AND DESDEMONA. H. Hoffmann, Saxony. £300  
 230 ST. PAUL AT MILETUS TAKING LEAVE OF THE ELDERS OF THE CHURCH OF EPHESUS. L. Nieper, Saxony. £400  
 236 THE VOYAGE TO THE NORTH BY THE DUTCH SAILORS HEEMSKERK AND BAREND, IN 1596. (See the poem of the Dutch poet Tollens). E. Koster, Holland. £200  
 237 CHURCH IN BELGIUM. P. Tetar Van Elven, Holland. £40

## BELGIAN SCHOOL.

### East Corridor, outside Belgian room.

- 231 TRUST IN GOD. L. Becker. £100  
 232 SOLITUDE. L. Dubois. £40  
 233 PORTRAIT OF H. M. GEORGE I. KING OF THE HELLENES. P. Hagelstein. £400  
 234 THE OBSEQUIES OF A TRAPPIST. C. E. Meunier. £120  
 235 LIBRARY OF THE CONVENT OF ST. LORENZO AT FLORENCE (seventeenth century). A. Mackelbach.

### Front Room, off East Corridor.

- 238 THE PRODIGAL SON. J. Verhae. £45  
 239 THE POULTERER. J. D. Platteel. £100  
 240 SLEDGE. H. Van Seban. £32  
 241 THE DOLL. V. De Gronckel. £32  
 242 INTERIOR OF A CHURCH. J. C. Schults.  
 243 THE OUTSKIRTS OF THE WATAI (May). H. Marcette. £40  
 244 SEA COAST OF BLANKENBERGHE. A. Francia. £72  
 245 VIEW OF THE COAST OF BLANKENBERGHE. F. Musin. £32  
 246 YOUNG GIRL OFFERING FLOWERS TO THE VIRGIN. F. Hazeleer. £22  
 247 THE LECTURE OF A YOUNG PAGE. F. Parfonry. £16  
 248 SPANIARD (Costume of Seville). J. De Senecourt. £24  
 249 MARRIAGE IN THE CHURCH OF ST. JACQUES. Bruges. E. Wallays. £20

\* The Goddess of Love and Beauty. † One of the Valkyries.  
 ‡ The Valkyries, are celestial virgins who bear off the souls of the slain in battle.

- 250 THE NORTH. C. Verlat. £40  
 251 THE CARPENTER. R. Parfonry. £7  
 252 CROSSING THE FORD. Jld. Stocquart. £60  
 253 ANNIVERSARY OF THE BATTLE OF WATERLOO. C. Wauters. £40  
 254 ARISTOCRACY AND DEMOCRACY. D. Col. £60  
 255 OUTHIRTS OF ESCAUT. E. De Schamphleer. £50  
 256 REMBRANDT EXAMINING ONE OF HIS ETCHINGS. C. Wauters. £40  
 257 INTERIOR OF THE PORT OF VENICE. A. Francia. £40  
 258 THE SOUTH. C. Verlat.  
 259 THE FISH-POND OF POLLEUR (April). H. Marcette. £20  
 260 MELODY OF THE EVENING. W. Linning. £40  
 261 HAMLET. C. Ligny. £20  
 262 FLEMISH INTERIOR. A. Plumot.  
 263 SHOEMAKER WORKING IN HIS SHOP. J. Van Regenmorter. £50  
 264 PREPARING. E. Lambrichs. £16  
 265 LANDSCAPE, WITH SHEEP. F. Van Severdonck. £10  
 266 STUDY AT THE FOUNTAIN. J. Bellemans. £80  
 267 HERD RESTING IN THE SHADE. Jld. Stocquart. £60  
 268 REMOVING ON THE RHINE. P. Vandervin. £60  
 269 LAKE WALLENSTADT, Switzerland. J. F. Rofsinen. £120  
 270 COCK AND HENS. F. Van Severdonck. £10  
 271 A BUOY DRIVEN FROM ITS ANCHORAGE. L. Barnaba. £25  
 272 CHAPEL OF THE MADONNA, St. Carlo, Rome. Vervloet. £9  
 273 THE PATH OF OUR LORD. Demarneffe. £500  
 274 DEFEAT OF THE TROOPS OF THE DUC D'ALENCON BY THE CITIZENS OF ANTWERP. Ad. Dillens. £400  
 275 CORNER OF THE CONVENT OF MOUNT CASINO, Papal States. Vervloet. £9  
 276 FLEMISH WORKMEN. Ad. Dillens. £24  
 277 THE AMATEUR PAINTER. B. Deloosse. £50  
 278 RACE-COURSE, WITH OBSTACLES. J. Moerenhout. £90  
 279 THE PLAZZETTA, Venice. B. Van Moer. £140  
 280 THE PETS. F. Melzer. £22  
 281 VILLAGE UNIVERSITY. L. Van Dycke. £50  
 282 THE PERILOUS DESCENT. J. Van Severdonck. £44  
 283 THE AWAKING OF THE LION. J. Stevens. £60  
 284 IN THE WOOD. A. Sodar. £40  
 284A THE VIRGIN AND INFANT CHRIST. C. Cleyneheer.  
 285 DOG AND FLY. V. Devos. £12  
 286 AT THE WOOD. C. Billoin. £40  
 287 HUT. F. Keelhoff. £32  
 288 MATERNAL EDUCATION. Mad. F. Goefn. £50  
 289 PORTRAIT, L. Dewinne. H. P. T. Barron.  
 290 THE GLEANERS. L. Taymans. £28  
 291 CONVALESCENT. E. Kathelin. £28  
 292 COQUETTERIE. Carolus. £56  
 293 THE LESSON. J. Wagner. £32  
 294 EFFECT OF THE SUN ON THE HEATHER AT ARDENNES. J. Kindermans. £60  
 295 CHURCH OF ST. DOMINICK AT CALATAYUD, near Saragossa. F. Bossuet. £120  
 296 THE ANGEL PROTECTOR. J. Bellemans. £80  
 297 SETTLING OF ACCOUNTS. V. Jansens. £32  
 298 GLADE IN THE FOREST OCCUPIED BY CHARCOAL BURNERS. J. Kindermans. £14  
 299 PERETTE. A. Goyers. £24  
 300 A MOTHER'S ADVICE, £25; and 301 THE SURPRISE. £30. F. Houzé. £30  
 301A FLOWERS AND FRUIT. H. Robbe. £22  
 302 PREPARING FOR THE MASKED BALL—EFFECT OF LIGHT. P. Van Schendel. £280  
 303 PORTRAIT. Mad. A. De Senecourt. £24  
 304 SUFFERING AND ABANDONED. F. Meltaer. £22  
 305 CANARY AMATEURS. D. Col. £40  
 306 THE VIKER (COSTUME OF THE ABRUZZI). Mdle. V. Bovis. £28



1100, burnt down in 1175, and rebuilt, as we now find it, about 1225.

**392 A POACHER BEFORE THE JUDGE.** P. Raadsig, Denmark. £65

**393 SUNSET—Swedish Coast.** Prof. E. Bergh, Sweden. £53

**394 YOUNG DEER.** Frisch, Denmark. £25

**395 DANISH BEECH FOREST—Spring.** A. C. Kjeldrup, Denmark.

**396 LITTLE KAREN** refuses the Crown offered to her by the King of Sweden, and asks him to leave it to his Queen, and to spare her honour. Madame E. Jerichau, Denmark. £200

**397 A BRIDE OF THE ISLAND OF ARMAC.** Prof. Exner, Denmark.

**398 A BASKET OF FRUIT.** Miss E. Rorsholdt, Denmark. £20

**399 A GENRE PICTURE.** A. Schiött, Denmark.

**400 PORTRAIT OF THORWALDSEN.** Prof. Gertner, Denmark. £70

Albert Thorwaldsen was the son of a poor ship carpenter from Iceland. In the turf-built parsonage of Møklebæ (near Akreyri, in the north of the island), dwelt his grandfather, who was priest of the place. Albert was born on the high seas between Iceland and Denmark, in 1770. Unnoticed or neglected in Copenhagen, his genius at an early age impelled him to Rome, where he arrived almost penniless; but having soon afterwards obtained employment in Canova's studio, his talent quickly developed itself by the beauty and genius of his designs. Ultimately he took a studio of his own, and modelled his statue of "Jason," but as he obtained no order for it, and could make no way in Rome, he in despair determined to quit it, and return to Denmark. All his arrangements were actually made for that purpose, when Mr. Hope, of London, seeing the cast of "Jason," was so much struck with its beauty, that he immediately ordered it in marble. This turned the tide of Thorwaldsen's fortune; and from that time his fame was established, and commissions poured in upon him. Thorwaldsen died suddenly in 1844, being then in his seventy-fourth year. Thorwaldsen's museum in Copenhagen contains the casts of all his works, as well as several of his statues in marble, which he presented to his native town. In accordance with the wishes of the sculptor, a tomb was built in the centre of the courtyard of the museum, in which his body was deposited on the 6th of September, 1848, when the museum was ready to be opened. At the bottom of the tomb is a black cross, with the year of his death, 1844; around its sides are roses and lilies on an azure blue ground; and on the coving stone are two palm branches. Thus Thorwaldsen's museum is likewise his mausoleum.—*Danish Hand-book for Thorwaldsen's Museum.*

**401 HEN AND DUCKLINGS.** J. D. Frisch, Denmark. £25

**402 EVENING ON THE BERNESE MOUNTAINS.** A. Becker, Düsseldorf. £300

**403 SOUND OF ELSINORE.** F. Sörensen, Denmark. £125

**404 KRONBORG CASTLE AT ELSINORE—where Prince Hamlet was buried.** F. Reichardt, Denmark. £63

This castle was built during the reign of Frederick II., about 1580, and in the time of Tycho Brahe. It is upon the north of the town, and close upon the shore of the Sound, which its guns command in all directions. The castle is built of white stone, in the Gothic style. It is surrounded by strong fortifications of comparatively modern construction.

**405 THE BATTLE OF SWINEMUNDE, 17th March, 1864.** F. Sörensen, Sweden. £70

**406 VIEW OF THE ØRESUND FROM ZEALAND.** O. A. Kille, Denmark. £60

**407 PRINCESS ALEXANDRA OF WALES, taken in 1862.** Prof. Gertner, Denmark. £75

**408 VIEW OF ULRICKSDAL.** J. Billing, Sweden. £25

**409 BELL ROCK—Scotland.** F. Sörensen, Denmark. £80

**410 BASKET WITH FLOWERS.** Miss L. Whittusen, Denmark. £50

**411 DANISH BEECH FOREST—Autumn.** A. C. Kjeldrup, Denmark. £20

**412 BRITANNIA.** Madame Jerichau, Denmark. £125

**413 MONK'S EMPLOYMENT.** Otto Knille, Berlin.

**414 BERNSTORFF CASTLE—The King of Denmark's Summer Residence, with the Royal Family of Denmark.** F. Reichardt, Denmark. £52 10s.

**415 SEA VIEW.** Fabarius, Düsseldorf. £25

**416 PORTRAIT OF PROFESSOR JERICHAU.** Madame Jerichau, Denmark.

**417 THE PROPOSAL.** Fagerlin, Sweden.

**418 THE ORPHANS,** Miss Hanstein, Sweden. £40

**419 SHIPWRECKED.** Madame Jerichau, Denmark. £400

**420 EVENING—Lago di Como.** Prof. E. Bergh, Sweden. £200

**421 SUNSET, IN THE PARK AT COPENHAGEN, with a View of the Sound and the Coast of Sweden.** E. M. Jensen, Denmark. £15 15s.

**422 MOSES, SUPPORTED BY AARON AND HUR, PRAYS FOR VICTORY.** Miss Hanstein, Sweden. £50

**423 A FOOTPATH AT ORDRUP'S KRAT, near Copenhagen.** E. M. Jensen, Denmark. £15 15s.

**424 WIGER SPA—The Lawgiver.** J. A. Malmström, Sweden. £120

**425 NORWEGIAN GIRL AT CHURCH.** Madame Jerichau, Denmark. £100

**426 BABY'S LAST CRADLE.** Miss A. Lindigren, Sweden. £210

**427 KRONBORG BY MOONLIGHT.** E. Walqvist, Sweden. £35

**428 DEATH OF TORQUATO TASSO.** J. Bellemans, Belgium. (See 191.) £240

**429 HORRING-SØETER, GUDBRANDSDALEN, NORWAY—Morning.** C. Wexelsen, Norway.

**430 GAMBLING TABLE—Kursaal at Baden-Baden.** D'Unker, Düsseldorf.

**431 QUEEN DOWAGER OF DENMARK; and 432 PRINCESS ALEXANDRA.** Madame E. Jerichau, Denmark. £100

**433 PUBLIC WORSHIP—Sweden.** Baron A. G. Koskull, Sweden. £53

**434 THE RECOGNITION OF ULYSSES BY HIS NURSE.** J. Stallaert, Belgium. £120

"That scar, while chafing him with open palms,  
The matron knew; she left his foot to fall;  
Down dropped his leg into the vase; the brass  
Rung, and, o'ertilted by the sudden shock,  
Poured forth the water, flooding wide the floor.  
Her spirit joy at once and sorrow seized;  
Tears filled her eyes; her intercepted voice  
Died in her throat."

COWPER'S *Odyssey*, Book xix.

**435 BRIDAL PARTY.** Eckersberg, Norway.

**436 FRENCH TROOPS IN ALGERIE.** Captain Ancarcrona, Sweden. £200

**437 ROMULUS AND REMUS.** H. Von Brücke, Berlin. £120

**438 THE PEDLAR JEW ON BOARD SHIP.** C. Lorck, Norway. £60

**439 CASTLE OF GRYPSHOLM—Sweden.** J. Billing, Sweden. £25

Grypsholm, an island in the Malar Lake, seven miles from Stockholm. The palace was built by Gustavus Vasa, but considerably altered and enlarged in the time of Gustavus III. Here Eric XIV., John III., and the deposed Gustavus IV., were all imprisoned at different periods of their eventful lives.—MURRAY'S *Hand-book*.

**440 THE EMPEROR CHARLES V. VISITING HIS MOTHER, JEANNE-LA-FOLLE.** C. Billoin, Belgium. (See 107.) £100

**441 LANDSCAPE, BONDHIMSBRIEN (Hardanger, Norway.)** Schanche, Norway. £90

**442 SUNSET—Swedish Coast.** Prof. E. Bergh, Sweden. £53

**443 ARABS REPOSING.** Captain Ancarcrona, Sweden. £25

**444 DALECARLIAN EVENING SCENE.** P. Eskilsson, Sweden. £35



- 516 LET THEM BE HAPPY. Fisher, Dresden. H. A. Payne, Esq. £50  
 517 CHRIST BEARING THE CROSS. Jäger, Leipzig. £400  
 518 FOREST ON FIRE (North America). J. F. W. Wegener, Saxony. £150  
 519 DUTCH COUNTRY GIRL FETCHING WATER. A. Mollinger, Dutch. £25  
 520 LION, LIONESS, AND CUBS (from nature). E. Meissener, Saxony. £28  
 521 THE FERRY-BOAT (Norway)—Scene in Pellemarken. S. Dahl, Saxony. £60  
 522 COMMUNION OF A DYING POLE. Prof. A. Piotrowski, Prussia. £40  
 522A SEA PIECE. E. Gabe. £15 15s.  
 523 DESERTED MILL. A. Sodar, Belgium. £32  
 524 ON THE MAIN (Bavaria)—SUMMER. W. De Klerk, Dutch. £28  
 525 PRINCE AND PRINCESS WILLIAM OF PRUSSIA ARRIVING, ON THEIR WEDDING TOUR, AT ANTWERP, 4TH FEBRUARY, 1858. A. Pleyzier, Dutch. £55  
 526 PORTRAIT OF PROFESSOR SCHMIDT, Saxony. By himself.  
 527 ON THE HIGH VELUWE (GUELDRES). A. C. Hazeu, Dutch. £17  
 528 VIEW OF THE WATZMANN MOUNTAIN FROM THE NEIGHBOURHOOD OF BERCHTESGADEN (Bavaria). J. Lange, Munich. £40  
 529 SHEEP. F. Berlin. £8  
 530 THE LITTLE FISHER GIRL. W. Herbig, Berlin. £20

## FOREIGN SCHOOLS. CARTOONS.

### Music Hall.

- 531 CAPTURE OF FREDERICK THE HANDSOME, AND HIS BROTHER DUKE HEINRICH OF LOWER AUSTRIA, IN THE BATTLE OF AMPFING. A. Muttenthaler, Munich. £46  
 532 THE MARRIAGE OF OTHO IV., EMPEROR OF GERMANY, SURNAMED THE SUPERB. A. Wagner, Munich. £46  
 533 ONE OF THE PROPHETS; 534 CARTOON FROM THE ROYAL CHAPEL—"All Saints"; 535 ONE OF THE SIX PROPHETS. H. Hess, Munich.  
 536 CHARLES X. OF SWEDEN VICTORIOUS OVER THE DANES IN A BATTLE FOUGHT ON THE FROZEN LITTLE BELT, 1658. T. Pixis, Munich. £79 16s.  
 During his short reign of six years Charles X. (of Sweden), surnamed Gustavus, was continually involved in war. Possessed of the greatest military talents, and desirous of emulating the glorious reign of his heroic uncle (Gustavus Adolphus), his disputes with Poland, Russia, and Denmark, successively involved Sweden in wars with this and other countries. His daring act of crossing with his army upon the ice of the Great and Little Belt, during the winter of 1657, is one of the most daring military feats upon record, and it enabled him to dictate his own terms to the Danes at the gates of their capital. But the success which attended his arms was not continuous; and he died young, in 1660. In compliance with his wishes, peace was concluded upon honourable terms, soon after his death, with all the enemies of Sweden; and a period of repose at length was obtained to recruit her exhausted resources. By Sweden Charles X. is justly esteemed one of her greatest kings, and his untimely death as the most severe blow that the national interests have ever sustained.—MURRAY'S *Hand-book*.  
 537 DEATH OF COUNT ARCO IN THE TYROL, 1703. P. Martin, Munich. £50  
 538 FOUR OF THE PROPHETS. H. Hess, Munich.  
 539 CHRISTIANITY PREACHED IN BAVARIA BY ST. SERVICIO. J. Frank, Munich. £30  
 540 LOYAL PEASANTS OF RAMSBACH CAPTURING REBEL PRISONERS. F. Piloty, Munich. £17 17s.  
 541 DESTRUCTION OF THE TOWER OF BABEL.—Kaulbach, Berlin.

- 542 DUKE ALBERT V. OF BAVARIA. J. Rockert, Munich. £30  
 543 CHARLES XI. OF SWEDEN AT THE BATTLE OF LUND. T. Pixis, Munich. £79 16s.

During the war which desolated the south of Sweden in the time of Charles XI. and Christian V. of Denmark, a most sanguinary battle was fought in the plain a short distance north-east of Lund, 1st December, 1676, in which upwards of 10,000 men perished. The Scandinavian monarchs, within whose dominions this part of Sweden was formerly comprised, were elected sovereigns of Scania upon the hill of Stiparebacken, about half a mile from the town. Olaf, Queen Margaretta, and Christian II. appear to be the last who observed this ceremony.—MURRAY'S *Hand-book*.

- 544 CONTEST OF THE MINNESINGERS, IN THE CASTLE OF WARTBERG. Schwind, Munich. £75

(In the Water Colour Gallery.)

- 175, 176, 177 THE TASK OF THE TELEGRAPH, THE LOCOMOTIVE, AND STEAM POWER. M. Echter, Munich. £67 10s.  
 178 CHRIST AND HIS APOSTLES. Solar, Spain.  
 179 Fourteen Cartoons illustrating THE PASSION OF OUR LORD. M. Von Schwind, Munich. £130  
 180 CHRIST IN GLORY, SURROUNDED BY ANGELS, ST. JOSEPH AND ST. HELENA BENEATH; and 181 THE VIRGIN IN GLORY, WITH ANGELS, ST. BARBARA AND ST. JOHN NEPOMUC BENEATH. J. Schrandolph, Munich. Each, £34 10s.  
 182 BUILDING OF THE CHURCH AT VIERPREHNHEILEGEN, A PLACE OF PILGRIMAGE IN FRANCONIA. A. Palme, Munich.

## VICTORIA CROSS GALLERY.

PAINTED BY L. W. DESANGES.

[The entire of this collection was purchased by Harry Woods, Esq., of Leeds, who, with great liberality, lent it to the Executive Committee.]

### Eastern Room, off South Corridor.

- 1 PRIVATE SAMUEL PARKES, V.C., 4th Light Dragoons.  
 In the charge of the Light Cavalry Brigade at Balacava, Trumpet-Major Crawford's horse fell and dismounted him, and he lost his sword; he was attacked by two Cossacks, when Private Samuel Parkes (whose horse had been shot), saved his life by placing himself between them and the Trumpet-Major, and drove them away by his sword. In attempting to follow the Light Cavalry Brigade in the retreat, they were attacked by six Russians, whom Parkes kept at bay, retiring slowly, fighting and defending the Trumpet-Major for some time, until deprived of his sword by a shot.  
 2 LIEUTENANT F. E. H. FARQUHARSON, V.C., 42nd Highlanders.  
 For conspicuous bravery when engaged before Lucknow, on the 8th March, 1858, in having led a portion of his company, stormed a bastion mounting two guns, and spiked the guns, by which the advanced position held during the night of the 9th of March was rendered secure from the fire of artillery. Lieutenant Farquharson was severely wounded while holding an advanced position on the morning of the 10th of March. The bastion was held all night by thirteen men of the Light Company, under the command of Lieutenant Farquharson, accompanied by the lamented Lieutenant Bramley, who did not long survive the glory of this achievement, having been shot through the head at the attack on Fort Rohea, in Oude, 15th April, 1858.—(See No. 29.)  
 3 MAJOR C. C. TEESDALE, C.B., V.C., R.A. Battle of Kars, 29th September, 1855.  
 For gallant conduct in having thrown himself into the midst of the enemy, who had penetrated during the darkness of the night into the Yuksek Tabla redoubt; thus encouraging the garrison to make so vigorous an attack as to drive the Russians therefrom, and prevent its capture. Again, when the enemy's fire had driven the Turkish artillery-men from their guns, by his intrepid example he induced them



Mangles, with signal gallantry and self-devotion, and notwithstanding that he had himself been previously wounded, carried for several miles out of action a wounded soldier of the 37th Regt., after binding his wounds, under a murderous fire, which killed or wounded almost the whole detachment, and he bore him safely to the boats.

**17 THE BATTLE OF KOOSHAH, 8th of February, 1857. LIEUT. AND ADJUT. MOORE, V.C., and LIEUT. J. G. MALCOLMSON, V.C., 3rd Bombay Light Cavalry.**

On the occasion of the breaking of the Persian square, by the 3rd Bombay Light Cavalry, led by Col. Forbes, C.B., Lieutenant Moore was foremost by a horse's length. He leaped into the square, and his horse fell dead, and he would inevitably have lost his life had not his gallant brother officer, Lieut. Malcolmson, observing the Adjutant's peril, fought his way back through the broken ranks of the enemy, and giving him a stirrup, safely carried him through everything out of the throng. The thoughtfulness for others, cool determination, devoted courage, and ready activity shown in extreme danger by this young officer, Lieut. Malcolmson, appear to have been most admirable, and to be worthy of the highest honour.

**18 COLOUR-SERGEANT H. M'DONALD, Royal Engs., V.C., Knight of the Legion of Honour.**

Date of act of bravery, 10th of April, 1856. For gallant conduct when engaged in effecting a lodgement in the enemy's rifle pits in front of the left advance of the right attack on Sebastopol; and for subsequent valour, when, the Engineer officers being disabled by wounds, the command devolved upon him, and he determinately persisted in carrying on the sap, notwithstanding the repeated attacks of the enemy.

**19 DR. HOME, V.C., and DR. BRADSHAW, 90th Regiment, V.C.**

In charge of the sick and wounded, having missed the road to the Residency, penetrated into the heart of Lucknow, when a fearful massacre by fire and sword took place. Nearly all the escort and dooley-bearers having been shot down by the mutineers, Drs. Home and Bradshaw, with a very few survivors, gallantly defended each other from behind some sheds until they were delivered from their living tomb the next day.—(See *Gubbins's Lucknow*.)—A Sketch.

**20 PRIVATE HENRY WARD, V.C., 78th Highlanders.**

For his gallant and devoted conduct in having, on the night of the 25th and morning of the 26th September, remained by the dooley of Sir H. M. Havelock, Bart., V.C., then Lieutenant H.M.'s 10th Foot, Deputy Assistant Adjutant General, Field Force, who was severely wounded, and on the morning of the 26th escorted that officer and Private Pilkington, 78th Highlanders, who, receiving a wound, had flung himself into the dooley, thereby causing the bearers to drop their double load. Ward, by his example and exertion, induced the bearers to take up their dooley again, and, with the same steadiness, as if on parade, brought his wounded officer and comrade in safety to the Baillie Guard.—(See *Relief of Lucknow*.)

**21 COM. W. N. W. HEWETT, R.N., V.C.**

1st.—On the occasion of a repulse of a sortie of Russians, by Sir de Lacy Evans' Division, on the 26th October, 1854, Mr. Hewett, then Acting Mate of Her Majesty's ship "Beagle," was in charge of the right Lancaster Battery before Sebastopol. The advance of the Russians placed the gun in great jeopardy, their skirmishers advancing within 300 yards of the battery, and pouring in a sharp fire from their Minié rifles. By some misapprehension the word was passed to spike the gun and retreat; but Mr. Hewett, taking upon himself the responsibility of disregarding the order, replied that "Such order did not come from Captain Lushington, and he would not do it till it did." Mr. Hewett then pulled down the parapet of the battery, and with the assistance of some soldiers, got his gun round, and poured upon the advancing column of Russians a most destructive and effective fire. For the gallantry exhibited on this occasion the Board of Admiralty promoted him to the rank of Lieut.

2nd.—On the 5th November, 1854, at the battle of Inkermann, Capt. Lushington again brought before the Commander-in-Chief the services of Mr. Hewett, saying, "I have much pleasure in again bringing Mr. Hewett's gallant conduct to your notice."—(Sir S. Lushington to Vice-Admiral Sir J. Dundas.)

**22 DR. SYLVESTER, V.C., assisted by CORPORAL SHIELDS, V.C., succouring Lieutenant and Adjutant Dyneley, 23rd Royal Welsh Fusiliers.—(See No. 36.)**

**23 LIEUT. (now MAJOR) LEITH, 14th, K.L.D., V.C., saving Capt. Need's life at the Battle of the Betwah, April 1, 1858.**

"I beg to do justice to Capt. Need's troop; they charged with steady gallantry the left, composed of the enemy's best troops, Velaities and Sepoys, who, throwing themselves back on the right, and resting the flanks of their new line (four or five deep) on two rocky knolls, received the charge with a heavy fire of musketry. We broke through the dense line which flung itself among the rocks, and bringing our right shoulders forward, took the front line in reverse, and routed it. I believe I may say that what Capt. Need's troop did on this occasion was equal to breaking a square of infantry, and the result was most successful. I have the honour to recommend to his Excellency's favourable consideration Capt. Need and his devoted troop, and Lieut. Leith, who saved Capt. Need's life, for which I have ventured to recommend him for the Victoria Cross."—*Major-General Sir Hugh Rose's Despatch.*—(See also No. 26.)

**24 LIEUT. COL. LLOYD LINDSAY, V.C., Scots Fusilier Guards.**

When the formation of the line of the regiment was disordered at Alma, Captain Lindsay stood firm with the colours, and by his example and energy greatly tended to restore order. At Inkermann, at a most trying moment, he, with a few men, charged a party of Russians, driving them back, and running one through the body himself.

**25 JAMES MOUAT, Esq., C.B., V.C., Dep. Insp.-General (late 6th Dragoon Guards), assisted by SERGEANT WOODIN, V.C., 17th Lancers, dressing Col. Morris's wounds under fire, at Balaklava, October 25th, 1855.**

**26 LIEUT. H. N. D. PRENDERGAST, V.C., Madras Engineers.**

Major-Gen. Sir Hugh Rose, in forwarding his recommendation for this officer, states:—"Lieut. Prendergast was specially mentioned by Brigadier, now Sir Charles Stewart, for the gallant act at Mundisore, when he was severely wounded; secondly, he was specially mentioned by me when acting voluntarily as my aide-de-camp in the action before besieging Ratgurh, on the Beena river, for gallant conduct; his horse was killed on that occasion. Thirdly, at the action of 'the Betwah,' he again voluntarily acted as my aide-de-camp, and distinguished himself by his bravery in the charge which I made with Capt. Need's troop, H.M. 14th Light Dragoons, against the left of the so-called Peishwa's army, under Tantia Topce; he was severely wounded on that occasion."

This last action forms the subject of the picture.—(See also No. 23.)

**27 COL. HENRY TOMBS, C.B., V.C., and LIEUT. JAMES HILLS, V.C., Bengal Artillery.**

On the 9th July, 1857, Lieut. Hills was on picket duty with two guns at the mound to the right of camp. At about 11 o'clock there was a rumour that the enemy's cavalry were coming down on this post. Lieut. Hills proceeded to take up the position assigned in case of alarm; but before he reached the spot, he saw the enemy close upon his guns before they had time to form up. Having given a rapid order to his Sergeant, Lieut. Hills boldly charged single-handed the head of the enemy's column, cut the first man down, struck the second, and was then ridden down horse and all. On rising he was attacked by three of the enemy; one he despatched; another he wounded, and having fallen in a struggle with the third, would have inevitably lost his life, but for the almost miraculous intervention of Col. Tombs, who, having crossed the path of the enemy's cavalry, and having escaped apparently certain death in so doing, shot one of the remaining assailants, and is represented in the picture as about to cut down the other.

**28 PRIVATE ANTHONY PALMER, V.C., 3rd Battalion Grenadier Guards.**

Present when the charge was made in defence of the colours, and also charged singly upon the enemy, as witnessed by Sir C. Russell; is said to have saved Sir C. Russell's life at Inkermann.

**29 LIEUT. T. A. BUTLER, V.C., 1st Bengal Fusiliers.**

"... of which success the skirmishers on the other side of the river were apprized by Lieut. Butler, of the Bengal Fusiliers, who swam across the Goomtee, and



**45 LIEUT. CHARLES G. BAKER, V.C., Bengal Police Battalion.**

For gallant conduct on the occasion of an attack on the rebels at Subejnee, near Peroo, on the 27th September, 1858. The charge ended in the utter defeat of the enemy, and is referred to by Lord Clyde as "deserving the highest encomium, on account both of conception and execution." It is also described as having been "as gallant as any during the war."

**46 SERGEANT SMITH, Bengal Sappers and Miners.**

"For conspicuous gallantry, in connexion with Lieutenants Home and Salkeld, in the performance of the desperate duty of blowing in the Cashmere gate of the fortress of Delhi, in broad daylight, under a heavy and destructive fire of musketry, on the morning of the 14th of September, 1857, preparatory to the assault."—*General Order.*

**47 BUGLER ROBERT HAWTHORNE, 52nd Foot.**

"Bugler Hawthorne, who accompanied the explosion party, 14th September, 1857, not only performed the dangerous duty on which he was employed, but previously attached himself to Lieut. Salkeld of the Engineers, when dangerously wounded, bound up his wounds under a heavy musketry fire, and had him removed without further delay."—*General Order.*

**48 LIEUT. (now CAPT.) ROBERT M. ROGERS, 44th (now of the 90th) Foot, PRIVATE JOHN M'DOUGALL, 67th Foot, LIEUT. E. H. LENON.**

For distinguished gallantry in swimming the ditches, and entering the North Taku Fort by an embrasure during the assault. They were the first of the English established on the walls of the fort, which they entered in the order in which their names are here recorded, each one being assisted by the others to mount the embrasure.

**49 LIEUT. (now CAPT. NATHANIEL BURSLEN, 67th, now of the 60th) Foot, PRIVATE THOMAS LANE.**

For distinguished gallantry in swimming the ditches, of the North Taku Fort, and persevering in attempting, during the assault, and before the entrance of the fort had been effected by any one, to enlarge an opening in the wall, through which they eventually entered, and, in doing so, were both severely wounded.

**50 CAPT. J. P. H. CROWE, 78th (now in the 10th) Foot.**

For being the first to enter the redoubt at Bourzecker Chowker, the entrenched village in front of the Busherat gunge, on the 12th August, 1857.

**51 LIEUT. F. D. M. BROWN, 1st European Bengal Fusiliers.**

For great gallantry at Narrivoul, on the 16th November, 1857, in having, at the imminent risk of his own life, rushed to the assistance of a wounded soldier of 1st European Bengal Fusiliers, whom he carried off under a heavy fire from the enemy, whose cavalry were within forty or fifty yards of him at the time.

**52 THE BATTLE OF INKERMANN.**

## PAINTINGS IN WATER COLOURS.

### BRITISH AND FOREIGN.

Room off South Corridor.

Water-colour art was proportionately less well illustrated than oil painting. There were, however, examples of a large number of the best deceased and living painters and designers, including Turner and Flaxman; and the following were particularly well represented:—F. W. Burton, several of his finest works, particularly the "Meeting on the Turret Stairs" (56); F. Newton, "Pass of Glencoe" (60); F. Walker, "Scene from Thackeray's 'Philip'" (101); H. Tidey; Sir William Ross; W. Collingwood; and an Irish artist, J. A. Jones, whose style has some resemblance to that of Mr. Lucas, one of the new members of the Water-Colour Institute. Among the engravings were some of the finest foreign works in line, and, in the same room, admirable etchings by Henriette Brown and T. Whistler.

**1 LEVEN'S HALL, WESTMORELAND. W. Collingwood, £63**

**2 THE LIFFEY, near Woodlands; and 3 THE SUGAR LOAF MOUNTAIN, CO. WICKLOW. J. Faulkner. E. Walsh, Esq.**

**3A STUDIES OF STILL LIFE (in three frames). P. Herwegen, Munich. Each, £3**

**3B A SKETCH. O. W. Nichols. £7**

**3C COAST SCENE, HOWTH. W. Dillon. £6**

**4 THE CARRARA MOUNTAIN, from Spezia. H. Stanmore. £3 3s.**

**5 THE BOLD SOLDIER BOY. M. Angelo Hayes. Joseph White, Esq.**

**6 SPANIEL AND PIGEON. R. Ansdell.**

**7 STUDY—THE BRIDE OF CORINTH. F. W. Burton.**

**8 PORTELET HARBOUR, GUERNSEY. P. J. Naftel. Captain Hartley.**

**9 THE SEVEN AGES OF MAN. F. Leighton.**

**10, 12 TWO STUDIES (in chalk). W. Holman Hunt.**

**11 CHRIST RAISING THE WIDOW'S SON. Miss E. Sharpe.**

**13 THE CAMPAIGNA. S. Palmer.**

**13A STUDIES OF STILL LIFE (in three frames). P. Herwegen, Munich.**

**14 STUDY OF A PEASANT OF THE CAMPAIGNA. F. W. Burton.**

**15 SETTER AND BLACK COCK. R. Ansdell.**

**16 THE KNOWLE GALLERY. S. Raynor.**

**17 THE GOLDEN AGE—(Design of Painting on roof of Great Gallery, Kilkenny Castle). J. H. Pollen.**

**18 THE SEVEN CHURCHES, GLENDALOUGH; 19 KILLINEY BAY, CO. DUBLIN; 20 BLACK CASTLE. J. Faulkner. E. Walsh, Esq.**

**21 ESQUIMALT, Vancouver's Island. G. B. Keating.**

**21A LANDSCAPE. E. C. D. Latouche.**

**21B QUEEN KATHERINE'S VISION. W. Blake. Sir Wentworth Dilke, Bart.**

**21C NEAPOLITAN COSTUMES (four studies). Gaetano Dura, Naples. Each £2 10s.**

**21D SEA PIECE. O. Bossoli, Turin.**

**22 THE LETTER. J. H. Pollen.**

**23 LA STELLA. T. A. Jones. £15**

**24 ON THE RHINE. J. M. W. Turner. W. P. R. Mills, Esq.**

**25 INTERIOR. W. Collingwood. — Till, Esq.**

**26 THE WIDOW OF WÖHLM. F. W. Burton. Miss Robinson.**

**26A BUDS OF PROMISE. T. A. Jones. £30**

**27 FORT ABERGLASLYN, North Wales. Miss Ruxton. £20**

**27A MOLLY ASTHORE. B. Mulrenin. £10 10s.**

**28 CHRIST BLESSING LITTLE CHILDREN. Tidey.**

**29 LIVERPOOL. W. Collingwood. £157 10s.**

**30 MARGUERITE IN THE CATHEDRAL, £25; 30A GOOD EVENING, £30. T. A. Jones.**

**31 DUNSTANBOROUGH CASTLE. J. Varley. W. P. R. Mills, Esq.**

**32 VIEW FROM BRAY HEAD. G. V. Du Noyer. £10**

**33 READING GIRL—(Study for Wall Painting, Kilkenny Castle). J. H. Pollen.**

**34 ON THE WHARF, Yorkshire. J. Gelder. £8**

**34A FOUR SPECIMENS OF ILLUMINATING ON PARCHMENT. P. Herwegen, Munich. Each £3**

**35 STUDIES OF IRISH PEASANTRY. E. Fitzpatrick. £10**

**36 NELSON AT YARMOUTH. W. Collingwood. £157 10s.**

**37 THE LENTEN MEAL. S. Raynor.**

**38 BETWYX-Y-COED MILL. P. D. Harding. Antonio Brady, Esq.**

**39 VINE ARBOUR AT CAPRI. M. G. Brennan, Rome. £30**

**40 LOCH ETIVE. C. Fielding.**

**41 IN THE ISLAND OF SKYE. G. Petrie, LL.D. W. Stokes, M.D.**

**42 NEAR TREFRIEW, North Wales. Miss M. Gauthorp. £5**



- 128a A FOREST SCENE (study in pencil). J. Meyer.  
 129 BIRDS—Angola Roller. V. Bartholomew.  
 130 DEAD PARTRIDGES. Mrs. Bloxsome. £15 15s.  
 131 THE NURSERY. G. G. Kilburne. W. J. Conlan, Esq.  
 132 TWO DESIGNS FOR ALTAR-PIECES. C. Lavergne.  
 133 OTHELLO THE MOOR'S PALACE, Venice. E. Gerhardt, Munich.  
 134 DEAD PHEASANT. Mrs. Bloxsome. £17 17s.  
 135 VIEW IN WALES. G. Hayes. £8 8s.  
 136 SKETCHES OF IRISH LIGHTHOUSES. By an Amateur.  
 137 VENETIAN TRABACOS. V. Lercke, Norway. £12  
 138, 139 TWO PORTRAITS IN CRAYONS. Rosalba. Mrs. Finucane.

## ARCHITECTURAL DRAWINGS, ENGRAVINGS, &c.

### Water Colour Room.

- 140 PRIZE DESIGN FOR CARLISLE BRIDGE—Four Drawings. R. Turner.  
 140a PAYING OUT THE SUBMARINE TELEGRAPHIC CABLE AT THE GULF OF SPEZIA, 24 July, 1854. Carlo Bossoli, Turin. Exhibited by the City Fine Arts Gallery, Turin.  
 141 THE PICTURE GALLERY, Kilkenny Castle. T. N. Deane.  
 141a ADMISSION OF A BABY INTO THE INFANT ASYLUM. E. P. Malfatti, Lucca.  
 142 MONAGHAN CATHEDRAL. J. J. M'Carthy.  
 143 ST. PATRICK'S CHURCH, Bandon. G. Goldie.  
 144 ST. WILFRED'S CHURCH, York. G. Goldie.  
 145 ROXBOROUGH. W. J. Barre.  
 146 KILMORE CATHEDRAL; 147 SHERBORNE ABBEY. W. Slater.  
 148 DESIGNS FOR CHURCHES. J. R. Carroll.  
 149 DESIGN FOR A TIMBER AND PLASTER CEILING. J. H. Pollen.  
 150 INTERIOR OF ST. PETER'S CHURCH, Phibsborough, Dublin; 151 CHURCH OF ST. MARY, Greenock.  
 152 DESIGN FOR THE CHURCH OF SS. PETER AND PAUL, Berne, Switzerland. G. Goldie.  
 153 DRUMGLASS, Dungannon; 154 PROVINCIAL BANK OF IRELAND, Belfast; 155 WHITWORTH HALL, Drogheda; 156 CROZIER MEMORIAL, Banbridge. J. W. Barre.  
 157 NEW ENGLISH CHURCH AT STOCKHOLM (two drawings in one frame). J. Souttar. £5  
 158 DESIGN FOR THE CATHOLIC UNIVERSITY. J. J. M'Carthy.  
 159 SPIRE TO THE CHAPEL AT BLANCHARDSTOWN. C. Geoghegan.  
 160 CHOIR OF ST. VINCENT'S CHURCH, Cork. G. Goldie.  
 161 CHANCEL OF CHURCH B.V.M., Lanark, Scotland. C. Colden.  
 162 NEW CHURCH, Crumlin road, Belfast; and 163 BRAY CHURCH. W. S. K. H. Carpenter.  
 164 DESIGNS FOR THE O'CONNELL MONUMENT, Two Drawings. Pugin and Ashlin.  
 165 DESIGN FOR PROPOSED METHODIST COLLEGE, Belfast. A. G. Jones.  
 166 LIMERICK CATHEDRAL. W. Slater.  
 167 FEMALE DORMITORY OF THE SCHOOL FOR DEAF AND DUMB, Old Trafford, Manchester; and 168 EXTERIOR OF SAME. Whyatt and Redford.  
 169 KILBUSH CONVENT. J. J. M'Carthy.  
 170 DESIGN FOR TOWN HALL, Sligo. J. R. Carroll.  
 171 DESIGN FOR THE O'CONNELL MONUMENT. C. Geoghegan.  
 172 CHAPEL OF ST. JOSEPH, Church of St. Martin de Rouhaix. Lavergne, Paris.  
 173 EXTERIOR OF ST. PETER'S, Phibsboro', Dublin. G. Goldie.

174 DESIGN FOR NEW TOWN HALL, at Bolton. T. Turner.

175 ARCHITECTURAL FRAGMENTS AND ORNAMENTS OF POMPEII, POMFITS, ROSATI, NAPLES.

176 ARCHITECTURAL DRAWING OF THE ARCH OF ALPHONSO OF ABRAGON IN CASTELLO NUOVO, NAPLES.  
 (See also some Drawings shown in the Natal Collection.)

## BRONZES, &c.

### In Water Colour Gallery.

- 191 THE AMAZON, group in bronze and silver. G. Kiss, Berlin. £54  
 192 BAVARIA, statuette in bronze. H. Wilke, Berlin. £3  
 193 & 194 HERONS, in bronze; 195 STORK, in bronze; and 196 FOX SITTING ON THE STUMP OF A TREE. S. Habenschaden, Munich.  
 197 A REAPER, in ivory. T. Hirt, Munich. £36  
 198 BAVARIA, after Schwanthaler, in silver gilt. Neustätter, Munich. £25

## ENGRAVINGS, &c.

### In the Small Room, off Water Colour Gallery.

- 1 JANMOT, Paris.—Study of Figure, in Pencil.  
 2 KELLER, JOSEPH, Düsseldorf.—The Dispute, after Raphael's Fresco in the Vatican, £18 10s.  
 3 ARNOLD, ERNEST, Dresden.—St. Cecilia, with the Four Saints, engraved by A. Le Fevre, Dresden, after Raphael, in the Bologna Gallery.  
 4 PISANTI, F. Naples.—Leo X., after Raphael, at the National Museum of Naples.  
 5 BATTISTA, GIOVANNI, Palermo (a Deaf Mute).—The Virgin and Child, a drawing in imitation of engraving.  
 SOCIETY FOR THE PROMOTION OF THE FINE ARTS, Turin:—6 Three Engravings by A. GILLI:—Portrait of Count Benevillo; the Prisoner of Chillon, after Gastaldi; Werther, after Facconti. 7 Three Engravings by the MARQUIS A. G. DE BREME:—The Fountain; Frontispiece to the Society's Album; A Quiet Hour, after Count Cossì. 8 Fishing, engraved by CAV. A. FONTANESI. 9 The Torrent, engraved by A. LAURO.  
 10 WHISTLER, T. London.—Etchings, in Twelve Frames.  
 11 LEIGHTON, JOHN, F.S.A.—The Life of Man—Twelve Subjects.  
 12 CORR, E. Brussels.—Two Engravings (unfinished), after Rubens—"Raising of the Cross," and "Descent from the Cross."  
 13 ARNOLD, E. Dresden.—The Concini Family, engraved by G. LEVY, after Paul Veronese, in the Dresden Gallery, £4.  
 14 LA LETA, G. Palermo (a Deaf Mute).—Two Drawings, in imitation of Engravings—"Moses with the Tables of the Law;" "The Ancient Italian Masters."  
 15, 16 BROWN, Mlle. HENRIETTE, Paris.—Two Etchings.  
 17 DINGER, JOSEPH, Düsseldorf.—Cromwell and his daughter, Mrs. Claypole, after Schrader, £6.  
 18 WILDIERS, T. Antwerp.—The Education of the Virgin, after Rubens.  
 23 THE SPANISH GOVERNMENT.—Twenty-five Views from "The Architectural Monuments of Spain." Fourteen Views from the same Work:—24-37, viz.:—24 Transverse Section of the Great Hall of Justice of the Royal Alcazar of the Alhambra, Granada. 25 Interior of Watchtower of Lindaraja, Granada. 26 A Part of St. John de los Reyes, Toledo. 27 Window of the Great Nave of the Cathedral of Toledo. 28 Chapel of St. James, in St. Maria de Alcala. 29 Tomb of Cardinal Guenez de Cineros. 30 The Old Cathedral of Salamanca. 31 General View of Toledo. 32 Crosses and Fanes of Guarrazar, Province of Toledo. 33 Tomb



competition. It was felt that such Exhibitions should be the tide-marks of the progress of nations, and should exhibit fairly the ebb and flow, the progress or decline in each department of knowledge and its results among the various families of the world. The contributions of each country should be kept as distinct as possible, so as to allow their various peculiarities to stand forth in relief whether they are faulty or meritorious, and the competition should be regarded less as one of individuals than as one of nations.

That this programme was not carried out as successfully as could have been desired is much to be regretted, but the blame of it must rest with the photographers of those countries who have supinely allowed the opportunity to pass. There was no civilized nation but received a pressing invitation to co-operate, and it can only be a matter of regret, but not of reproach, to those in charge of the Department that the Foreign contributions, though some of them of a high class of merit, are so few and so little representative. With regard to the British portion of the collection this supineness is less observable; and although, as remarked by the jurors, the names of a few—a very few—are “conspicuous by their absence,” it may be safely asserted that rarely (in Ireland never) has there been collected together under one roof, so complete and beautiful a collection of the kind.

In attempting some slight analysis of the photographs exhibited it may be convenient to classify them as follows:—

- 1,193 Portraits.
- 1,189 Landscapes and Architectural subjects, &c.
- 159 Composition subjects.
- 330 Copies of Paintings, Sculpture, &c.
- 136 Microscopic photography.
- 525 Stereoscopic photography.
- 640 Ethnological photography.
- 1 Enamel processes.
- 27 Enlargements.
- 6 Photo-zincography and photo-lithography.
- 19 Photo-sculpture.

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4,225—Total.

India and the Colonies furnished a very fair collection of photographs, which were shown in their separate courts, and most of these are included in the foregoing summary, but may here be separately specified, viz.:—

Portraits:—

Canada,	-	-	-	-	33
Nova Scotia,	-	-	-	-	2—35

Landscapes and Architectural subjects:—

Canada,	-	-	-	-	203
India,	-	-	-	-	5
Mauritius,	-	-	-	-	4
New Zealand,	-	-	-	-	6
Nova Scotia,	-	-	-	-	12
Victoria,	-	-	-	-	60—290

Stereoscopic Photography:—

Canada,	-	-	-	-	41
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Ethnological Photography:—

Australian colonies,	-	-	-	-	5
Canada,	-	-	-	-	27
India,	-	-	-	-	606
Natal,	-	-	-	-	2—640

Photo-zincography:—

Victoria,	-	-	-	-	4
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Total Indian and Colonial, - 1,010

There were also several bound books of Photographs shown in the Roman, Italian, and German Courts, and in the Canadian Department.

It would ill become me to express an opinion upon the comparative merits of individual exhibitors—that is a task which the Executive Committee has confided to the jurors in the several departments without restriction or interference, and to their Report the reader is referred without comment on my part; but I cannot allow the present opportunity to pass without acknowledging a peculiar debt of gratitude due to one foreign exhibitor—Monsieur Fierlants, of



41 WINDOW and BRIDGE, 63A Baker st. London, W.—One frame of "Diamond cameo" portraits.

42 LAWRENCE, J. 39 Grafton st. Dublin.—Carte-de-visite portraits; large-size photographs in oil colours; diamond cameo portraits.

43 M'LEAN and HARR, 7 Haymarket, London, S.W.—Untouched portraits.

44 HANSON, W. Leeds.—Vignetted portraits. (See No. 105.)

45 COX, A. W. and H. 11 St. James st. Nottingham.—One frame of portraits, cartes-de-visite, &c., taken by wet collodion process; iron development. (See No. 72.)

46 MAWSON and SWAN, 9 and 13 Mosley st. Newcastle-upon-Tyne.—Two portraits on opal glass, by the Simpsontype process; portraits and three landscapes, by Swan's patent carbon process. (See No. 114.)

47 LOCK and WHITFIELD, 178 Regent st. London.—Five photographic miniatures, being one portrait of H. R. H. the Prince of Wales, and four portraits of H. R. H. the Princess of Wales, in one case.

48 TURNER and EVERITT, 3 Cheapside, City, and 17 Upper st. Islington, London.—Frame containing twenty untouched cartes-de-visite, by the wet process, iron developed.

49 ROBINSON, H. P. 68 Canonbury park South, London, N.—Photographs and cartes-de-visite.

50 FOSTER, A. P.—Coloured photograph.

59 FOSTER, R. LE NEVE, London.—Twelve portraits in one frame.

#### On Table in West Room.

51 INTERNATIONAL PHOTOSCULPTURE COMPANY (LIMITED), Winchester House, Old Broad st. City, London.—Thirty-five statuettes, busts, medallions, &c., by the new process of photosculpture.

52 CASKET-PORTRAIT CO. 40 Charing cross, London.—Six miniatures, Swan's patent process.

53 HELSHY, W. G. 34 Church st. Liverpool.—Thirty newly invented heliocaristotypia miniatures, in one case.

54 SCHAUER, GUSTAV, Berlin.—Two books of photographs.

55 LA TOUR DE MAIRNE.—Book of photographs.

56 JOHNSON and Co. Leamington.—Stereoscopic transparencies, photographed by W. B. Johnson. (See Nos. 34 and 98.)

57 BEAU, A. 283 Regent st. London. Revolving cartes-de-visite. (See No. 4.)

58 GIOVANETTI, LEONARDO.—Lucca.—New secret process of oil varnish, especially adapted for making double copies of engravings.

#### In Central Room.

61 GOOD, F. M. Western road, Hove, Brighton.—Photographs and stereographic views, in ten frames.

62 BROWNBIGG, T. M. Constabulary Office, Castle, Dublin.—Photographs by the collodion process; twenty five frames.

63 MORGAN, J. H. Parklands, Clifden, near Bristol.—Eighteen photographs.

64 JOCELYN, VISCOUNTESS (deceased).—Groups and landscapes.

65 WARNER, W. H. Ross, Herefordshire.—Photographs untouched, by the wet collodion process. (See No. 29.)

66 SANDERSON, W. D. 2 Mulberry st. Manchester.—Photographic and stereoscopic views—all by the collodio-albumen process. (See No. 143.)

67 M'LEAN and HARR, 7 Haymarket, London, S.W.—Untouched portraits, and stereograms of wild animals. (See No. 43.)

68 ROSS, J. 90 Princes st. Edinburgh.—Two frames of photographs taken from life, by the collodion process. (See No. 26.)

69 FALL, J. W. Ironbridge, Shropshire.—Twenty-four photographs, being a series of views near Coalbrookdale, Shropshire, in two frames.

70 WILSON, SIR T. M. BART. Charlton House, London, S.E.—Landscapes, portraits, &c., in one frame.

71 GRIGGS, W. Indian Museum, London.—Photographs.

72 COX, A. W. and H. St. James' st. Nottingham.—Views of English scenery, by the wet collodion process, in two frames. (See No. 45.)

73 VERSCHOYLE, H. W. Lieut.-Colonel, Grenadier Guards, 23 Chapel st. Belgrave sq. London.—"Studies from Nature," collodio-albumen, printed by the Wothlytype process; views of the Alhambra, collodio-albumen.

74 PIPER, J. D. 24 Silent st. Ipswich.—Landscapes, &c., by the wet collodion process, in one frame.

75 LOWE, E. J. F.R.A.S. F.L.S. &c. Observatory, Beeston, near Nottingham.—Frame of stereoscopic pictures, from dry plates of collodio-albumen.

76 MAREK, F. 79 Grafton st. Dublin.—Untouched photographs, consisting of cabinet and stereoscopic landscapes, views of Irish scenery, in seven frames. (See No. 33.)

77 REJLANDER, O. G. Maldon road, London.—Two frames of photographs from nature. (See No. 36.)

78 GILLIS, T. 10 Rue d'Etigny, Pau.—Ten photographic views in the Pyrenees; four of them executed by "Major Russell's tannin process."

79 AMATEUR PHOTOGRAPHIC ASSOCIATION, 12 York place, London, W.—Seventeen frames of prize pictures.

80 WINGFIELD, HON. L. 37 Grosvenor sq. London.—Views in England and Ireland.

81 CAITHNESS, EARL OF, 17 Hill st. London.—Photographic views of Winter scenes; a road locomotive.

82 BULLOCK BROTHERS, 20 Lower parade, Leamington, Warwickshire.—Photographs from life, "Good Tidings," and "Nearing Home."

83 HEATH, V. 43 Piccadilly, London.—Nine frames containing twenty-seven photographs of landscapes, &c.

84 SEDGFIELD, W. B. Park road, Norbiton, Kingston-on-Thames.—Eight views at Killarney, by the wet collodion process. (See No. 139.)

85 PENNY, G. S. 14 Rodney terrace, Cheltenham.—Four photographic landscapes, by the tannin and malt preservative process. (See No. 138.)

86 LONDON STEREOSCOPIC AND PHOTOGRAPHIC COMPANY.—Twelve frames of prize pictures. (See No. 14.)

87 CURRIE, F. E. Lismore Castle, Lismore.—Eight photographic views.

88 CAMERON, MRS. Freshwater Bay, Isle of Wight.—Groups; portraits, &c., in four frames. (See No. 32.)

89 HEMPHILL, W. D. M.D. Clonmel, co. Tipperary.—Twenty photographs from nature.

90 HAINES, H. 82 Grand parade, Cork.—Untouched photographic views of Irish scenery, taken by the wet collodion process, with iron development, and pyrogallie intensifier, in eight frames.

91 WARDLEY, G. 10 St. Ann's sq. Manchester.—Six photographs by the collodio-albumen process.

92 HOW, J. 2 Foster lane, London.—Photographs of microscopic objects, from negatives by Dr. Maddox, in three frames.

93 HOWIE, W. Southport, Lancashire.—Photographs of the Lancashire Hussars, in two frames.

94 ROUGH, W. WHITE, 180 Strand, London, W.C.—Landscapes, statuary, &c. in six frames.

95 ABERCROMBIE, J., M.D. and WILSON, E. T., M.B.—Photo-micrographs in two frames (taken by artificial light).

96 M'COMAS, W. Melbourne.—Five photographs, in frames.

97 MILLARD & ROBINSON, 39 Lower Sackville st. Dublin.—Views, specimens of photo-printing in carbon and on enamel. (See No. 26.)

98 JOHNSON & COMPANY, Leamington.—Three frames of views in Devonshire. (See Nos. 34 and 56.)

99 BRASLEY, F. 30 Upper Hamilton terrace, St. John's wood, London.—Six photographic views taken by the Fothergill dry process.

100 JONES, B. Selkirk villa, Cheltenham.—Six photographs by the tannin and malt process.

101 COGHILL, SIR J. J. BART. Glen Barrahan,



179 PARISH.—Two enlarged photographic portraits.—(*Nova Scotia*, No. 57.)

180 VERGNET, L'ABBE DE, Carcassonne.—Photography applied to numismatics.—(*In French Court*, No. 110.)

#### JURY.

A. CLAUDET, F.R.S., Photographer to her Majesty, London.

P. LE NEVE FOSTER, M.A., Secretary of the Society of Arts, London.

#### REPORT OF THE JURY.

THE department of Photography at the International Exhibition of Dublin, as might be expected from the geographical position of that city, does not exhibit so complete a representation of the art as could be wished. Many photographers of reputation in England, France, Germany, America, and other countries, are wanting; and this deficiency is the more observed when we recollect the great display of Photography at the International Exhibition of 1862, and the splendid specimens there collected from all parts of the world. We must, however, bear in mind that Photography had then attained a very high state of perfection, and that it was not to be expected it could, in so short a period as three years, show any very great advance. Nevertheless, under all disadvantages, it must be admitted that the display is successful.

The Photographic Department has been well organized; spacious rooms of an easy access have been devoted to the display of the specimens. The only thing to be regretted is the want of top light, without which no picture can be shown to advantage, and especially photographs, which are generally taken either in open air or under skylights, with light from above. As a rule, pictures should be viewed with the light in the same direction as that in which they are produced or painted; otherwise there is something false and unnatural in the effect. For this reason photographs, being nearly always taken with the light more above than under an angle of 45°, should be exhibited under top lights.

Notwithstanding these somewhat hypercritical remarks, made for the sake of a better arrangement in future Exhibitions, the public has had a very good opportunity of examining and comparing the merits of all the various specimens exhibited, including some interesting new processes introduced in the art since the Exhibition of 1862.

These new processes are—the Wothlytype, the developing by formic acid, the Simpsontype, the casket portraits, photosculpture, and carbon processes. These new discoveries have given to the Dublin Exhibition a character of great interest, and go far to compensate for many of its unavoidable deficiencies. The absence of many English and foreign photographers of reputation is apparent from the deficiency of artistic character, particularly in portraiture, though, of course, there are brilliant exceptions; and we call attention to this with the desire of pointing out to photographers how essential is this quality, and that without it photographic portraiture cannot obtain the support of the well educated part of the community, and deserve the encouragement of those who, by their studies and artistic instruction, generally lead the taste of the public. In portraiture the aim should be, not only to produce well-defined, clear, and good photographs, but to give to the sitter a natural pose, without vulgarity; to arrange the draperies with taste; to avoid unnecessary and incongruous accessories; and so to light the subject that the features and countenance will be brought out in the most favourable way. We are especially led to these remarks by the examination of a number of portraits and groups exhibited by Mrs. Cameron, which, although as photographs are very indifferent—arising, possibly, from the want of first-rate apparatus, a sufficient ex-

perience in manipulation, or from other causes—are the works of a true artist. There is no experienced judge who would not prefer these productions, with their manifest imperfections, to many of the best manipulated photographic portraits which are to be seen in the Exhibition. The more Mrs. Cameron's productions are examined the more they are appreciated. At first sight they may be neglected and misunderstood, but at a second and third visit her frames are those which at once attract attention.

That composition is the main quality in photographic portraiture, and that mechanical skill and artistic taste may be united with it, is well exemplified in the portraits and groups exhibited to which medals are awarded. In addition to those selected for award of medals, the studies by the late Viscountess Hawarden are worthy of the highest commendation. The Jury feel sensibly the loss which the photographic art has sustained in the death of so accomplished an artist, and regret that they are thus prevented from marking their sense of the merit of Lady Hawarden's pictures by the award of a medal.

A cursory inspection of a number of photographic portraits will generally enable a correct judgment to be formed how far the operator is a person of taste and refinement, and has had artistic training. Such men never exhibit what is deficient in effect and composition; as they cannot always be successful, they have the good sense to know their failures, and they reject or destroy every negative, however perfect it may be as a photograph, if the artistic effect and composition are not completely satisfactory.

There is another point which, though not strictly connected with photography, calls for observation. We allude to the mounting and frames in which photographs are frequently exhibited. Here again the true artist may be detected by his choice in this direction. When photographs are surrounded by gaudy borders, strange devices, inartistic ornaments, and discordant colours, it can scarcely be expected that they have been produced by operators of sound taste; and when examined it will assuredly turn out that they exhibit more or less incongruity or irregularity in the pose and composition. These remarks have been called forth by the display of too many of this class of mounting and frames in the present Exhibition.

The choice of the subjects for exhibition is another test of the artistic training and natural disposition of the operator. The portraits exhibited should be of eminent persons, in whom the public take an interest, the principal merit in such an exhibition being its historical and instructive character, or they should be selected as illustrations of beauty of features and excellence of form. A photographer who exhibits productions without reference to these conditions, however perfect they may be as the result of manipulation, lowers the art he is practising, and shows that he is not an artist.

In many cases frames are exhibited containing one or two dozen of portraits, without any care or reason for their selection, and the exhibitor would have better served his interest and his reputation had he chosen out of that number two or three specimens and rejected all the others.

The same remark may be made respecting the reproductions of landscapes, buildings, and views of ancient and modern architecture. None should be exhibited if the subject has nothing to make it interesting. The subject chosen by the photographer is the surest criterion of his feeling and taste, and in exhibiting pictures which please the eye and elevate the mind, he ennobles the art he is practising. The desideratum for a photographer is to know when he has succeeded in producing a satisfactory result—and this, it appears, is not so easy a matter.

It is not to be supposed that such men as Bedford, Maxwell Lyte, Mudd, England, Heath, and others, have never failed in their attempts. But they have had the judgment and good taste never to exhibit a



instrument, which elegantly illustrates a very extraordinary phenomenon of optics.

In coloured photographs Messrs. Lock and Whitfield stand deservedly at the head of this branch of the art; the portraits exhibited by these gentlemen display a high degree of artistic execution and skill in selection of pose and treatment.

Among the interesting objects for the delineation of which photography has been applied, the jury desire to notice the views, taken by the Countess of Rosse, of Lord Rosse's Great Telescope, and its arrangements.

The Photographic Exhibition of Dublin has had the advantage of bringing before the public a new application of photography, consisting in the process known as *Photosculpture*. A number of busts and statuettes, illustrating the process, have been exhibited by the International Photosculpture Company. The inventor, M. Villème, an eminent French sculptor, having first tried to avail himself of such photographs as he could procure as a guide when modelling, was struck with the idea that if instead of only one portrait he had a great number of photographs, representing the person all round from every point of view, he might use them each in turn to shape his model by means of a pantograph, one point of which could follow consecutively the outlines of each pantograph sufficiently enlarged, while the other point of the photograph would transfer, in any reduced scale desired, the same outlines on the block of clay.

The sitter being placed in the middle of a glass room, surrounded by twenty-four cameras, all operating at once, as many photographs can be taken at once in a few seconds. M. Villème considered that thus he had all that he wanted to transform his block of clay into a perfect plastic representation of the features, forms, and character of the person, and this work being done, he had only to smooth down the roughness of the various cuttings, and to communicate to the model all the refinement which his skill as a sculptor could suggest. The result, as is shown by the specimens exhibited, has proved the merit and the power of the invention. Photosculpture must be hailed as one of the most useful and noblest applications of photography; and it is destined to spread the taste for sculpture, which is now confined to a very limited number of highly-educated minds in the higher classes of society. Photography has received another beautiful and useful application by the process invented and practised by M. Lafon de Camarzac. Some specimens are exhibited by M. Silvy, a photographer distinguished by his artistic taste. One of them is from a photographic negative taken by M. Silvy, representing a group of a great number of distinguished persons, including some members of the Royal Family of England, and the ex-Royal Family of France, at the *fête champêtre* given last year at Orleans' House, in aid of the funds of the "Société Française de Bienfaisance."

Photography on enamel presents many advantages, the pictures being burnt in or fixed by the action of fire, like metallic colours on porcelain or glass, are not liable to fading like photographs on paper, and they may form ornaments to be worn by ladies, or placed in cabinets or on tables in the drawing-room, as they are indestructible except by breaking. As enamels they may be painted in colours, also burnt in, and unalterable, and resemble the finest miniature on ivory. Those who have had the opportunity of admiring at the Kensington Exhibition the beautiful collection of enamels painted by old and modern artists, will be glad to know that photographic portraits may be transformed into similar indestructible and splendid miniatures by living painters, who, having only to impart to the photograph the natural colours, with all the refinement which their skill may suggest, will produce the most valuable and perfect works of art.

There has been at the Dublin Exhibition a deficiency of instantaneous stereoscopic productions, such as those which were exhibited at the International Exhibition of 1862, by Messrs. Ferrier and Soulier, by Mr. Wilson

and others, the effect of which was so beautiful and extraordinary. It is to be regretted that this class of photographs has not been largely represented; however, there has been enough shown to illustrate the capabilities of instantaneous photography; Mr. Breese has exhibited his marvellous effects of moonlight, sea, and clouds scenery. Nothing can more fully express the instantaneity of Mr. Breese's process, than his having been able to represent the waves of the sea during their rapid rolling motion in curling form with spray, suspended in the air, and falling in vapour, while sea gulls are seen flying above watching for their prey. In looking at such marvellous pictures we feel transported, as by magic, before the actual scenes, and the illusion of reality is irresistibly impressed on the mind. The means employed by Mr. Breese to produce these combined effects show great ingenuity, patience, and a considerable amount of artistic taste, for no one with a knowledge of photography can for a moment imagine that the sea or landscape have been taken simultaneously when only lighted by the moon, which is represented above. To produce such effects with the light of the moon would require a photographic preparation two or three hundred thousand times more sensitive than any process known. The moon itself can produce its own image, because lighted in the same degree by the sun it reflects a light as intense as ordinary clouds in the day time, which clouds operate instantaneously.

Micro-photography has also been represented by the frames exhibited in the English department by Dr. Maddox (92), showing some very well defined tests considerably magnified. M. Duvette (122), in the French Department, shows some very good specimens; and particularly a remarkable one of a flea enlarged, piecemeal, many thousand times.

M. Dagron also has exhibited some beautiful specimens of micro-photography; they are mounted at one end of a very small cylinder of glass, the other end of which is ground like a microscopic lens, generally called the Stanhope lens, but of which Sir David Brewster claims the invention. The tube is about one-quarter of an inch long, its diameter one-sixteenth of an inch. It is wonderful to think that this constitutes a microscope, with its lens at one end and the photograph at the other end. Although this photograph is imperceptible to the naked eye, still by looking at it through the minute microscope we see the portrait of a person as large as nature; a page of the Bible we can read as easily as in the book. This minute optical instrument, with its imperceptible photograph can be mounted in rings, watch keys, pin, or any other small ornaments. The productions of M. Dagron are a very charming and wonderful combination of photography and microscopy, in which he has seen his way to a considerable branch of manufacture; and for this object he has formed a large establishment, in which, by a well-organized division of labour, by well-combined machinery, everything is done on the spot—taking the large photograph, reducing to the microscopic size, manufacturing the small microscope, mounting the picture, making the articles of jewellery themselves. M. Dagron has exhibited the instrument by which he can reduce any photograph to the microscopic size, and by which he can produce at once, upon a collodion plate of about three inches by three inches, twenty-five or thirty microscopic pictures. The pictures are afterwards divided by a cutting diamond, ground in disks and fixed at the end of the small microscope. The whole process is very rapid, simple, and ingenious, and so well constructed, that the microscope, with its photograph, can be sold as low as twelve shillings per dozen, ready to be mounted by the jeweller in any kind of trinket or ornament.

At the suggestion of Sir David Brewster, M. Dagron has produced stereoscopic pictures, and mounted them at the two ends of the gold bar by which a watch chain is held in the buttonhole of the waistcoat. The gold bar is no longer than two inches, and it may be extended by a sliding tube to two and a half, to suit any separation



**SAXONY.**

146 HANFSTAENGL, H. *Dresden*.—For excellence in his reproduction of paintings.

**HONOURABLE MENTION.****UNITED KINGDOM.**

12 NELSON & MARSHALL, 11 *Upper Sackville st. Dublin*.—For their cartes de visite.

27 CRANFIELD, T. *Grafton st. Dublin*.—For his artistic arrangements of portraiture.

17 SILVY, C. 38 *Porchester terrace, London, W.*—For artistic excellence.

31 HENNAH & KENT, 108 *King's road, Brighton*.—For artistic merit.

35 COOPER, H. JUN. 5 *Aberdeen Park, Highbury, London, N.*—For his good manipulation.

38 WANE, M. *Douglas, Isle of Man*.—For artistic merit.

40 MANCHESTER PHOTOGRAPHIC COMPANY, 14 *Ridgefield, Manchester*.—For the interesting collection contributed by its members.

48 TURNER & EVERITT, 17 *Upper st. Islington, and 3 Cheapside, London, E.C.*—For good manipulation.

61 GOOD, F. M. *Western road, Hove, Brighton*.—For good manipulation.

62 BROWNRIGG, T. M. *Constabulary Office, Oastle, Dublin*.—For good manipulation.

65 WARNER, W. H. *Ross, Herefordshire*.—For good manipulation.

66 SANDERSON, W. D. 2 *Mulberry st. Manchester*.—For good manipulation.

67 M'LEAN & HAES, 7 *Haymarket, London, S.W.*—For their interesting series of instantaneous pictures of wild animals.

74 PIPER, J. D. 24 *Silent st. Ipswich*.—For excellence of manipulation.

82 BULLOCK BROTHERS, 20 *Lower parade, Leamington*.—For artistic composition.

84 SEDGFIELD, W. R. *Kingston-on-Thames*.—For good manipulation.

85 PENNY, G. S. 14 *Rodney terrace, Cheltenham*.—For good productions by the tannin and malt process.

87 CURRIE, F. E. *Lismore Castle, Lismore*.—For good manipulation.

88 CAMERON, MRS. *Freshwater Bay, Isle of Wight*.—For artistic composition.

90 HAINES, H. 82 *Grand Parade, Cork*.—For good manipulation.

91 WARDLEY, G. 10 *St. Ann's sq. Manchester*.—For good manipulation.

100 JONES, B. *Selkirk villa, Cheltenham*.—For good productions by the tannin process.

101 COGHILL, SIR J. J. BART. *Glen Barahane, Castle-townsend*.—For good manipulation.

102 COLLIS, J. 2 *Richmond terrace, London*.—For good manipulation.

103 FRITH, F. JUN. *Reigate*.—For good manipulation.

141 BULL, J. *Anglesey villa, Cheltenham*.—For good manipulation.

144 WATKINS, H. *Regent st, London, W.*—For good manipulation.

161 SMITH, J. S.—For good productions from paper negatives.

**CANADA.**

BOARD OF WORKS, *Quebec*.—For the collection exhibited by them.

HENDERSON, A. *Montreal*.—For his good manipulation.

171 HENRY, C. S. *Lennoxville*.—For his good manipulation of photographs, shown by Prof. Miles.

NOTMAN, *Montreal*.—For his good manipulation.

**INDIA.**

BUXTON, E. C.—For his interesting collection.

960 & 982 GRIGGS, W.—For his series of photographs representing tribes and castes of India.

**NOVA SCOTIA.**

11 CHAMBERS.—For good manipulation.

56 O'DONNELL.—For good manipulation.

57 PARISH.—For good manipulation.

**VICTORIA.**

126 CORNELL, F. *Melbourne*.—For good manipulation.

128 NETTLETON, C. *Melbourne*.—For good manipulation.

**AUSTRIA.**

162 AUSTRIAN MUSEUM OF INDUSTRY.—For good manipulation.

**BAVARIA.**

126 to 133 ALBERT, J. *Munich*.—For good manipulation.

134 BÖTTGER, G. *Munich*.—For good manipulation.

**FRANCE.**

24 ROLLOY, FILS, *Hyères*.—For good manipulation in enlargement.

78 GILLIS, T. *Pau*.—For his good production by the tannin process.

125 ROUBERT, J. *Paris*.—For good manipulation.

127 BERENGER, MARQUIS DE, *Paris*.—For good manipulation.

**ITALY.**

150 BARBI & CINOTTI, *Gubbio*.—For their interesting application of photography to the reproduction of old inscriptions.

153 DURONI, LONGONI, & DELL'ACQUA, *Milan*.—For their skilful enlargement.

**ROME.**

156 LUSWERGH, G. *Rome*.—For good manipulation.

**SWEDEN.**

158 CURENIUS & QUIST, *Stockholm*.—For good manipulation.

END OF DESCRIPTIVE CATALOGUE.











## DECLARATION OF JURY AWARDS.

THE Jurors in the different sections having brought their labours to a close, it now became necessary to make their awards public with some kind of ceremonial as was done at the London Exhibition of 1862; and though the limited time at the disposal of the Executive Committee prior to the final close of the Exhibition fast approaching, naturally prevented anything like a state pageant being attempted, yet it was determined to give the occasion as much *eclat* as circumstances would admit. The consent of the Right Hon. the Earl Russell, Lord Houghton, and Sir Robert Peel, Bart., to take part in the proceedings, having been obtained, the evening of the 2nd of October was fixed for the ceremony, in the Great Concert Hall, which was brilliantly lighted up and appropriately decorated for the purpose. The bands of the 8th and 24th Regiments were in attendance, and performed a well selected programme during the evening. The building was densely crowded; amongst those who received cards of invitation were the following:—

The Right Hon. Earl and Countess Russell, the Lord Chancellor, Earl of Meath, Earl of Wilton, Earl of Howth, Earl of Rosse, Earl of Lucan, Earl of Clancarty, Earl of Charlemont, Lord Houghton, Lord Southwell, Marquis of Kildare, Lord Talbot de Malahide, Lord Powerscourt, Lord Anally, Lord Viscount Gough, Marquis of Drogheda, Sir R. Peel, the Lord Mayor, Sir P. Nugent, Anthony Lefroy, M.P.; the Attorney-General, Charles Barry, Q.C., M.P.; Mr. Justice Fitzgerald, Major-General Colomb, Mr. Repton, M.P.; Capt. Henry, Colonel M. Taylor, Col. Wodehouse, Col. Hinde, Col. Redmond, Col. the Hon. S. J. G. Calthorpe, Col. Buchanan, the Quartermaster-General, the Adjutant-General, Mons. Livio, French Consul; J. Martin, Esq., J.P., Danish Consul; C. Palgrave, Belgian Consul; R. Welch, Austrian Vice-Consul; W. B. West, United States Consul; William Scott, Vice-Consul for Sweden and Norway; Chevalier Marani, Consul for Italy; Wm. Burke, Vice-Consul for Spain; R. Martin, Esq., J.P., Vice Consul for Prussia; B. M. Tabuteau, Consul for Netherlands; T. H. Wisdom, Consul for Hamburg; T. Bewley, Dr. Cameron, Dr. Maunsell, J. Robinson, Capt. L. E. Knox, G. W. Maunsell, J.P.; J. S. Green, C.E.; Professor Harvey, F.R.S.; T. Gresham, J.P.; Wm. Russell, J.P.; Geo. Alexander Hamilton, LL.D.; Sir William Wilde, Dr. Stokes, the President of the Royal College of Surgeons, the President of the Royal College of Physicians, Very Rev. R. Macdonnell, D.D.; Very Rev. Dean Graves, Colonel Wynyard, Major Speedy, Colonel Hillier, Right Hon. Sir Hugh Rose, the Solicitor-General, Captain Miller, R.N.; Lieut.-Col. Baker, assistant to Military Secretary; A. J. Ferrier, Ald. Campbell, J.P.; F. R. Trevor, E. Fottrell, J.P.; S. W. Haughton, H. Macdonnell, Thomas Vance, J.P.; J. W. Switzer, W. A. Stephens, Thomas Pim, J. Lentaigne, J.P.; Wm. R. Lentaigne, Sir R. Kane, Sir George Hodson, Bart.; J. Tufnell, F.R.C.S.; B. B. Stoney, C.E.; T. Borthwick, J.P.; A. Macdonnell, Dr. G. J. Stoney, T. C. Trench, Dr. Stewart, R. Mallet, Rev. H. Lloyd, D. Crosthwaite, F. Barrington, B. G. McDowel, M.D.; T. M. Hutton, R. C. Wade, Capt. Wilcox, Herr Elsner, R. J. M'Naughton, Professor Downing, J. T. Elrington, LL.D.; Gen. Gordon, J. F. Lombard, A. Parker, Peter Graham, E. Corbière, G. Delaney, R. Wilson, J. Whelan, S. Kershaw, the Presidents of Queen's Colleges, Belfast and Galway; J. L. Wharton, W. L. Payne, H. Brow, W. Lindesay, J.P.; J. Hatchell, J. H. Richards, A. Usher, H. T. Vickers, H. L. Fry, F. and R. Chance, Samuel Law, J. Vance, O. Bianconi, James Forrest, A. E. Guinness, W. Graham, Justice O'Hagan, P. Fitzgerald, R. G. Collis, J. R. Vernon, Lord J. Butler, D. M'Birney, G. Hancock, Lord St. Lawrence, F. R. Davies, J. K. Austin, M. A. Hayes, W. H. Hallaway, Rev. G. B. Wheeler, E. W. Maunsell, G. E. Ilbery, Wm. Taylor, J. P. Culverwell, W. G. Stopworth, J. Dowd, P. Howell, A. Beauvire,

Very Rev. Dr. O'Connell (Dean), Very Rev. Dean of St. Patrick's, his Grace Dr. Cullen, his Grace the Archbishop of Dublin, W. Eykelbosch, T. Martin, Wm. Arthur, T. C. Scott, Orlando Beater, T. Scovell, J. Maguire, P. Neville, Sir J. Dombain, Col M'Causland, Col M'Kerlie, Capt. Roberts, J. Good, W. G. Webb, Capt. Needham, C. C. Vesey, J. A. Walker, A. Corrigan, Edward Purdon, W. Jones, Joseph Boyce, R. D. Scott, Professor Wilson, G. Scott, C. T. Moore, E. D. Mapother, C. Sibthorpe, R. Butcher, C. W. Scott, Francis Robinson, Capt. Esmonde, Rev. J. H. Jellett, Thomas Grubb, G. A. Stephens, M. Cor Vander Maeren, W. Chappelle, W. Charley, T. S. Fetch, Thomas Crosby, A. Churtou, Joseph Metcalf, Ald. Atkinson, J. R. Kirk, R. Milliner, W. E. Steele, M.D.; J. T. M'Carthy, A. Jones, J. A. Keatinge, A. Claudet, A. Copeland, T. West, C. Atkinson, P. Langan, P. L. Simmonds, A. Homes, Alfred Tyler, Charles Cobbe, Lord Cloncurry, Sir R. Griffith, Bart.; M. Brooks, Sir R. Howard, John Fry, David Drummond, Major-Gen. Sir T. Larcom, E. H. Kinahan, F. Codd, Sir James Power, Bart.; A. H. Bagot, J. K. Bonsall, Right Hon. J. Napier, Professor Allman, C. W. Hamilton, Val. O'B O'Connor, Laurence Waldron, N. R. Powell, M. J. Brady, A. Balfe, Viscount Dunlo, Capt. Isaacke, G. Hooper, C. W. Townsend, Capt. Thornhill, T. W. Peters, Phineas Rinal, J.P.; C. Cotton, Robert Collins, Henry Andrews, F. W. Brady, Q.C.; Hon. Judge Berwick, the Hon. J. P. Vereker, G. F. Mulvany, Alderman M'Swiney, William M'Kay, Sir E. Grogan, Bart.; Sir B. Burke, Gilbert Sanders, B. L. Guinness, M.P.; C. Smith, W. L. Barrington, Charles Barrington, Sir T. Deane, J. E. Vernon, Sir R. Shaw, Bart.; Edward Barrington, Sir J. J. Coghill, Bart., the Hon. St. John Butler, Master of the Rolls, Lord Justice of Appeal, Right Hon. Judge Keogh, Judge Christian, J. L. O'Farrell, Lord Chief Baron, Hon. Baron Fitzgerald, Baron Hughes, Baron Deasy, Lord Chief Justice, Lord Chief Justice of the Common Pleas, W. Brooke, J. I. Murphy, G. Fitzgerald, Col. Lake, B. Litton, Judge O'Brien, Judge Hayes, Sir John Gray, Right Hon. James Whiteside, M.P.; Ion T. Hamilton, M.P.; Andrew Thomas, T. Apjohn, M.D.; R. Galloway, Mons. A. Gages, H. Simpson, Professor Sullivan, C. R. C. Tichborne, and Professor Jukes, &c., &c.

At eight o'clock the chair was taken by his Grace the Duke of Leinster.

The Duke of Leinster, who was loudly cheered, said:—My lords and gentlemen, it gives me very great pleasure to attend here this evening to announce the awards to the several successful exhibitors. I regret to have to state that his Excellency the Lord Lieutenant, in consequence of a family affliction, is unable to attend here this evening. I believe the best thing we can do is to proceed at once to the business of the evening.

Mr. Sanders, Chairman of the Executive Committee, introduced the jurors to the chairman and Earl Russell, who handed in their awards in the different Sections.

The Lord Mayor said the pleasing duty devolved upon him of proposing the thanks of that great assembly and of the citizens of Dublin to the Right Hon. Earl Russell for the aid he had given the Exhibition, and for his presence on that occasion. It might be considered as another indication of the great interest the British Government took in the welfare of Ireland. When he told them what Earl Russell had done for that International Exhibition, this vote of thanks he was sure would be carried with the greatest acclamation. Earl Russell was the first Minister of the Crown who made a move in support of the Exhibition. Through him the Government were induced to give it their support, and by his despatches and great influence foreign nations were led to co-operate with the Executive Committee. For these reasons he was entitled to the thanks of this assembly and of the whole country. He (the Lord Mayor) wished to take that opportunity of









the country upon the real success of this Exhibition. Nothing has occurred to mar that success. On the contrary, it appears to me that everything has combined to give effect to results which, at the outset, some of the least sanguine might have hesitated to expect, but which they will now most cheerfully acknowledge to have been fully realized. Everything has combined to make this great Exhibition a success in the United Kingdom. We have had the most glorious season for years. It has shed its benignant influence over the land, and thousands and tens of thousands of people have been diverted to these shores in the first place to study and examine the universal products assembled within the walls of this magnificent palace, and then I am glad to say they have been induced to extend their visit, and to view the beautiful coast scenery of this island, or if they pleased better to go more or less to more remote localities, where interesting relics of the past most abundantly invite the attention of the traveller, the *sergent*, and the archaeologist. When I am alluding to the great success of this Exhibition, there is one feature, and one which I think upon an occasion like the present should not be omitted to be mentioned, and it is this, that, notwithstanding the thousands and tens of thousands who have come to this capital, almost exclusively by one line of railway, from Kingstown to Dublin, not one single accident, not one single mishap, so far as I am aware, has occurred to throw a gloom on the journey over which all are hurrying. I can feel that this is a feature that should not be omitted to be mentioned when we are congratulating ourselves upon the success of an undertaking of this magnitude and importance. And now we have the ceremony of this evening, which, to my mind, adds another page to the series of interesting topics which this Exhibition has called forth. And those gentlemen who, upon this platform now, have been invited and have been welcomed to share in the honours which this Exhibition affords, must, ladies and gentlemen, have felt deeply flattered by the distribution of awards at the hands of the distinguished statesman who has honoured us with his presence this evening, and who has kindly lent his assistance to give *relat* to our proceedings. I propose to you, then, a vote of thanks to the jurors of the several sections into which the products contained in this Exhibition have been divided, and if it is not presumptuous on my part, I will, in your name, thank them for the assistance which they have given, and I will say more—that when the present season is past—when all the products which are here assembled have been again apportioned to where they came from, or elsewhere, the recollection of their valuable, their disinterested, and their gratuitous services will live within the memory of all who have taken an interest in the prosperity of the Dublin International Exhibition of 1865.

The Right Hon. the Attorney General, in seconding the motion, said:—I think I can add but little to what Sir Robert Peel has said. I can only say that the decision of these jurors, unlike the decisions of most jurors, I believe, has not been challenged, and its fairness has not been questioned. I believe these jurors have brought to the decision of the questions which have been laid before them the greatest patience, the greatest industry, and the greatest intelligence; and though it is not possible to please everyone when you decide in favour of a particular class or a particular individual, yet I believe the manner in which the duties of the jurors have been discharged has been such as, at least, to carry home the conviction, to the mind of everyone interested, that they had brought to the discharge of that duty nothing but the most entire fairness, and the most perfect impartiality. The question who has obtained a prize in an Exhibition of this character is perhaps a transitory one, and one which will soon be forgotten; but the influence which an exhibition of this kind is calculated to leave upon the minds of those who have witnessed it, and have partaken of its triumphs, is one not likely soon to pass away; and I hope for my fellow-citizens of this great

city that while this great building and palace, in which the Exhibition has been enshrined, is allowed to remain as a permanent record of the past Exhibition, and, at the same time, when many of these glorious works of art and fancy shall have disappeared, there will be left behind an influence and a power which will not cease to animate the minds and influence the feelings of those who have been fortunate enough to admire those prizes of art and those works of industry which this Exhibition has presented before them. And it was no small pleasure to witness the satisfaction which was produced in the minds of those who came up from the rural districts to visit it; and we feel they will go back to their homes carrying with them many a valuable lesson; and the lessons which this Exhibition of 1865 has taught cannot soon be forgotten by the people of this country. I have great pleasure in seconding the vote of thanks which has been so eloquently proposed by Sir R. Peel.

Mr. Alexander Parker returned thanks on the part of the jurors. He said they had no notion of laying the Exhibition Committee under so heavy an obligation as it would appear from the eloquent speech of Sir Robert Peel they had done. They had endeavoured to bring to the discharge of their duties such judgment and discrimination as they possessed. He hoped that it would appear that they had cherished a spirit of impartiality, and he was convinced that if a jury of revision were to pronounce upon the awards which had been made they would give in a verdict of approval. Of course he did not mean to include those who were disappointed exhibitors; for it was impossible to please everybody, and some selection should be made in bestowing medals. They had sought to find out intrinsic merit, and to preserve the value of their awards, but he believed that upon the whole the jurors had shown a proper liberality in the distribution of prizes. The gentlemen with whom he was associated were occupied in deciding upon the merits of textile fabrics of all kinds, from the most delicate lace to the strongest frieze. International Exhibitions followed so closely upon each other's heels that it was difficult to perceive an appreciable improvement made in the short space of time which elapsed between each event of the kind. But in the present Exhibition they had specimens of all the most creditable manufactures of the age. He believed they were deeply indebted to Earl Russell for the efforts which he had made to promote the success of the International Exhibition, and for his presence that evening. If his Grace would permit him to refer for a moment to another subject he might say that they were specially indebted to Lord Russell for having come amongst them at the present time, when, having escaped from the visitation of the cattle plague, they were threatened with a pestilence amongst the people. He was glad that Lord Russell was at present in Ireland in order that he might see that such agitations were but ripples upon the surface, and only tended to make loyalty more true, and treason more impotent.

Lord Houghton said:—Ladies and gentlemen, I don't know that much is due to your executive officer for having caught a chance tourist and brought him here to take part in this interesting Exhibition; but when I was asked to do so, remembering the interest that I have always taken in matters of this kind in the last London Exhibition, and that I have lately had the honour of opening the most successful provincial Exhibition in England, I thought that I could not refuse, although I felt that my presence here on this occasion might be considered an intrusion. At the same time I will never consider anything intrusive that brings an Englishman to speak in Ireland, or an Irishman to speak in England. It is for want of a little more of this intrusion that there is a difference between us, and if these intrusions were more frequent I should be the more pleased. I am asked to propose a vote of thanks to the several bodies who have acted as Committees of Advice in this matter. These committees were composed of men of all classes in the community, and they have been the means of



Over that institution the Duke of Leinster would still preside; he would guide and direct it, and it would be to him a source of delight to witness the enjoyment thereby afforded.

Viscount Southwell felt great pleasure in seconding the motion, and bore testimony to the services daily rendered by the Duke of Leinster during the progress of

the building, and the arrangement of its contents for re-opening.

The motion was passed by acclamation.

His Grace having briefly returned thanks, the proceedings terminated with a musical performance.

The following is a representation of the obverse and reverse of the medal given:—



## BANQUET AT THE INTERNATIONAL EXHIBITION.

[July 20th, 1865.]

THE Executive Committee considering that some kind of compliment ought to be paid to the Jurors who had, many of them at great personal inconvenience, gratuitously performed most important and arduous duties in the different sections; also that it would be necessary to show some hospitality to the Foreign and Colonial representatives and other distinguished strangers attending the Exhibition before they left Ireland, determined to give a grand banquet, to which were invited the jurors, foreign and colonial commissioners, representatives and agents, and every one officially connected with the Exhibition whose position entitled him to the compliment.

In order to render the occasion as distinguished as possible, his Excellency the Lord Lieutenant, the Right Hon. the Lord Chancellor, the Commander of the Forces, and every high official, both civil and military, were invited. Exhibitors were also allowed to purchase tickets at a fixed price, and a large number availed themselves of the privilege.

Over 800 sat down to dinner, which was served up in a manner that reflected great credit on the refreshment contractors, the Messrs. Douglas.

The band of the 61st Regiment was stationed in an ante-room, and played during the evening a choice programme of music. A number of leading artists also gave a pleasing selection of glees and madrigals between the toasts.

Benjamin Leo Guinness, Esq., M.P., presided; on his right sat the Lord Lieutenant and the Commander of the Forces; on his left the Lord Mayor and the Lord Chancellor.

The vice-chair was occupied by Gilbert Sanders, Esq., Chairman of the Executive Committee.

The cloth having been removed,

The Chairman said that in the absence of the noble chairman, the Duke of Leinster, who unfortunately was absent in London, he had been unexpectedly called on to preside over this great and distinguished company. The object they had in view was to show their gratitude and warmest feelings to the jurors and foreign commissioners who had done them the honour of attending that great Exhibition. Their duty had now commenced, and he was commissioned by the Executive Committee to express their gratitude and obligation to the gentlemen who had done them the honour of visiting that country. The first toast, your Excellency, my lords and gentlemen, is "The health of her Majesty the Queen." The mention of her Majesty's name has always, in every country of her extended dominions, excited feelings of gratitude, admiration, and attachment, and I believe we all feel it is the universal opinion of her Majesty's subjects that a better sovereign never reigned over a free people. Her object has been the benefit of all her subjects; and no matter at what personal inconvenience, she has always shown a desire to advance the happiness of her subjects, to do what she was called on to do in her high position for the advancement and prosperity of her people. I therefore, with your Excellency's permission, give you "The health of her most gracious Majesty the Queen."

Air—"God save the Queen."

The Chairman—My lords and gentlemen, the next toast I have to propose to you is "The health of his Royal Highness the Prince of Wales, her Royal Highness the Princess of Wales, and the rest of the Royal Family." We cannot forget the late visit of his Royal Highness to this Exhibition. He most cordially and courteously consented to come over to open the Exhibition. He mingled amongst us with the greatest



be permitted to make a remark which, perhaps, may be thought somewhat disparaging to another branch of industry, I must say that in the competition in China the famous old manufacture of Saxony is falling behind. All who are at all acquainted with the manufacture of china must see that the modern Dresden china is retrograding. Our own china manufacture is steadily advancing, and French china, as I believe, is fully maintaining its reputation. You see, also, here excellent specimens of a manufacture which is a remarkable instance of the results of loosening the bands of unwise legislation—I mean the manufacture of glass. I don't know any product of British industry more remarkable than the beautiful glass exhibited here, and which we have seen in other places. The success of that manufacture, which formerly did not flourish in England, shows how it is possible, in the face of very severe competition for a manufacture, to establish itself so as to defy all competitors. Gentlemen, besides the various other products of industry which we see around us, we have also a very beautiful exhibition of the fine arts, and I think it is very interesting to observe that works of taste in these exhibitions are now generally combined with works of more material industry, because it shows that we are thoroughly awakened to the necessity of joining taste to skill, and of not neglecting form and beauty in our manufacturing products. Wonderful as has been the progress of the present age in manufactures and mechanical skill, I think all must admit that we have greatly, in many respects, fallen behind the ancients in works of taste and art. But there are strong symptoms, I will not say that our inferiority in some branches will not continue, but that, at all events, we shall make a very great advance in competing with ancient models of art and beauty. From Italy, which has sent many most beautiful objects, we have some admirable specimens of statuary, that art in which, more than any other, we have hitherto found ourselves unable to compete with the best ancient models. There is, I believe, nothing of greater importance to England and Ireland than to cultivate the sense of beauty and form. It is no doubt chiefly in that we have fallen behind, and what we require is that we should have the common ordinary products and utensils of life made of beautiful and tasteful shapes, which they can be made as cheaply as they are made of ugly and untasteful shapes, and to have them constantly placed before the population. We don't want merely amateurs in art and *dilettanti* who may be skilled in these subjects from travel and reading. We want to familiarize the eyes of our common people, if I may call them by that name, with common things possessing that beauty of form which nature has intended all things should possess. If you can get those common things constantly before the eyes of the people, I for one believe their minds will by degrees be filled with ideas of beauty, and that there will be cultivated amongst them the taste and breeding necessary to great progress in the arts. Gentlemen, I am convinced that in that lies the true path of progress, and I believe in that also lies one of the principal securities of advancing civilization. You want to humanize the people; you want to make them familiar with those delights of mind and taste which have been hitherto confined principally to small sections, and to the wealthier classes. I look, therefore, to exhibitions of this kind, combining objects of art and beauty with the products of handicraft, as of great importance. I say this the more because while we will all admire the progress we have made in the mechanical arts, I think we shall do well not to be wrapt up too much in mere self-complacency with the progress we have obtained, but to look rather to the very long road which we have got to travel. Because, though material wealth is of the utmost importance to a population, as it is the true and solid foundation upon which progress must be built, yet there is something still more important than material wealth, and sorry I should be to think we should ever forget that amidst all the wealth and splen-

dour, especially in the great towns of manufacture, and in the great seats of commerce in England—with all that wealth and splendour—we know that many of the population, not only in Ireland, where, alas! there is too much poverty patent to every eye, but that even in England and other countries where greater prosperity prevails, there are great masses of the population who are denied much of the comforts and all the luxuries of life. And unless we can extend both morally and materially the well-being of the great masses of the population, we have done but little to advance the higher objects which men must have in view. It is because I believe we are advancing in that direction, and because I think we are alive to the necessity of combining national wealth with moral culture and with the culture of beauty and art, that I welcome Exhibitions of this kind which prove how well man has learned to use his capacities in creating wealth and turning to his own account the stores with which Providence has bountifully endowed him.

After a brief pause,

His Excellency rose and said:—My lords and gentlemen, I wish to be allowed to perform the pleasing duty of proposing "The health of the gentleman who presides over this Assembly." I am aware of no person who could more properly preside on such an occasion as this, as he is a man himself prosperous by industry and who has won the affections, I may say, of all the people of Dublin. Although no one could expect me to have the bad taste to introduce political topics on an occasion of this kind, I may be permitted, without the least allusion to politics, to say that I congratulate the city of Dublin upon its having secured so excellent a representative as the gentleman who presides here; and therefore, without meaning the slightest disparagement either upon any gentleman who has formerly represented Dublin, or any one who may aspire to represent it hereafter, and without any allusion to the distinctive politics which we all have at heart, but keeping ourselves free from that, I think I may say that the city of Dublin has been very fortunate in sending to Parliament two gentlemen who, whatever may be their political opinions, at all events represent the wealth and intelligence of the city. I beg to give you "The health of Mr. Benjamin Lee Guinness."

The toast was drunk with applause.

The Chairman on rising to respond was most warmly cheered. He said:—May it please your Excellency, my lords, and gentlemen, I can but ill express the gratitude I feel towards his Excellency for the way in which he has mentioned my humble name, and for the manner in which you have been pleased to receive it. I have long been attached to the interests and the welfare of the city of Dublin. My family has been connected with the city I may say for centuries, and I have myself always looked on it as that spot most dear to me. A new and interesting connexion has lately arisen between the city of Dublin and myself. You have been pleased, gentlemen, to send me to represent you in Parliament. I can only promise that in that capacity, so far as my ability will serve me, you will not be disappointed. His Excellency has been pleased to allude to my connexion with the great Exhibition, but although I have from its origin been connected with it, I cannot take much credit to myself for the great success that has attended it. There are other members of the executive committee who have far more claims to the honour and credit of the success of the Exhibition than I have. I will not delay you further than to return you my grateful thanks. May it please your Excellency and gentlemen, I beg to propose a toast of more importance than the last, "The Army and the Navy," coupling with the toast the names of Sir Hugh Rose, the Commander of the Forces, and Captain Miller, the distinguished commander of our guard ship.

The toast was duly honoured.

Air—"Peace to the souls of the heroes."

Sir Hugh Rose said the army would feel grateful for







GG. MISCELLANEOUS	
Salway Peach, very superior, - - - -	Charles Turner, Esq., of Slough. Bronze Medal.
Admirable Peaches. Warburton, - - - -	Sir R. Peel, Chief Secretary's Lodge, Phoenix Park. First Prize.
A dish of Morell Cherries, - - - -	Earl Fitzwilliam, Gorey, 10s.
„ Tomatoes, - - - -	Sir R. Peel, 10s.
„ Tomatoes, - - - -	Capt. Stavelly, Croydon Park, Co. Dublin, 5s.

GOURDS		Value of Prizes	
		1st.	2nd.
§ I. Gourds eatable when ripe.			
Class.		£.	£.
1 The Finest collection. (Foreign growth), - - - -		30	15
2 The Finest Collection. (Home growth), - - - -		30	10
3 The heaviest single specimen. (Home growth). First Prize: Miss Hempenstall; Second Prize: Hon. Mr. Proby, - - - -		15	10
4 The heaviest single specimen. (Foreign growth), - - - -		15	10
§ II. Gourds for Ornament, or merely Curious, and not eatable.			
5 The most extensive collection, without regard to cultivation, - - - -		30	15
§ III. Mixed.			
6 Six Ornamental Gourds, whether eatable or not, - - - -		15	10

The Gourd show was almost a failure, there being only three specimens of home, and none of foreign growth exhibited. The heaviest came from Miss Hempenstall, of Sandymount; the next in merit from Glenart Castle gardens. In the way of Ornamental Gourds, the only specimen shown was one by the Secretary of the Exhibition, Henry Parkinson, Esq.

GARDEN ROOTS AND VEGETABLES	First	Second	First Prize	Second Prize	Highly Commended	Commended
Class.	£.	£.				
1 Potatoes, collection of, 12 tubers of each variety,*	15	10	Messrs. Patterson & Son,	J. Gough, Esq.,	No Entry,	No Entry.
2 Onions, 12, - - -	10	5	Nth. Dub. Union,	Thos. Thompson, Esq.,	Marquis of Headfort,	Captain Stavelly.
3 Carrots, 12, - - -	10	5	Thos. Thompson, Esq.,	Earl Fitzwilliam,	T. Barlow, Esq.,	T. Hutton, Esq., D.L.
4 Parsnips, 12, - - -	10	5	Ditto,	T. Barlow, Esq.,	T. Hutton, Esq., D.L.,	Marquis of Headfort.
5 Globe Artichokes, 12, - - -	10	5	Chas. Cobbe, Esq.,	Thos. Thompson, Esq.,	No Entry,	No Entry.
6 Chervil, 12 roots, - - -	10	5	No Entry,	No Entry,	No Entry,	No Entry.
7 Beet, 6 roots, - - -	10	5	Captain Stavelly,	T. Barlow, Esq.,	T. Hutton, Esq., D.L.,	H. Manders, Esq.
8 Turnips, 3 kinds, 6 of each, - - -	10	5	Earl Fitzwilliam,	Thos. Thompson, Esq.,	No Entry,	No Entry.
9 Turnips, 6 of one kind, - - -	10	5	T. Barlow, Esq.,	H. Manders, Esq.,	No Entry,	No Entry.
10 Scorzonera, 12 roots, - - -	10	5	Chas. Cobbe, Esq.,	Earl Fitzwilliam,	No Entry,	No Entry.
11 Peas, 1 dish, - - -	10	5	T. Barlow, Esq.,	Duke of Leinster,	Thos. Thompson, Esq.,	Marquis of Headfort.
12 Brussels Sprouts, - - -	10	5	H. Manders, Esq.,	T. Hutton, Esq., D.L.,	No Entry,	No Entry.
13 Borecoles, 3 kinds, 2 of each, - - -	10	5	Thos. Thompson, Esq.,	J. Gough, Esq.,	No Entry,	No Entry.
14 Brocoli, 6 heads, - - -	10	5	Captain Stavelly,	Earl Fitzwilliam,	No Entry,	No Entry.
15 Cabbage, Savoy, 6 heads, - - -	10	5	Nth. Dub. Union,	T. Barlow, Esq.,	Thos. Thompson, Esq.,	No Entry.
16 Cabbage, any other kind, 6 heads, - - -	10	5	T. Barlow, Esq.,	H. Manders, Esq.,	Captain Stavelly,	Thos. Thompson Esq.

\* Potatoes were only shown by the Messrs. Patterson and Sons, Dundee, and Mr. Gough, steward to the Convent of St. Clara, Harold's-cross. Messrs. Patterson had a most interesting display.



## BRASS BAND CONTEST.

ARRANGEMENTS were made for a grand brass band contest to take place on the 12th of October and two following days, and numerous valuable prizes were offered by Mr. Higbband, the eminent brass musical instrument maker of Manchester, and also by Messrs.

Chappell and Co., of London; and a number of bands from England and Ireland entered for competition; but, owing to the tempestuous state of the weather, only three bands came forward, and the contest was not a success.

## THE REFRESHMENT DEPARTMENT.

THE catering for multitudes of hungry visitors at places of public resort is a very important matter, if carried out satisfactorily to the visitors, and so as yet to leave a fair profit for the labour and outlay of the contractors. The Executive Committee advertised for tenders, in the public papers in London, Paris, and Dublin, and on the 14th March the Refreshment Committee appointed reported to the Executive Committee that tenders had been sent in from seven contractors, but that two only had complied with the conditions and terms supplied by the Committee, viz:—

Mr. Morrieh, of Liverpool (contractor at the London Exhibition in 1862), and the Messrs. Douglas, of Dublin.

The Messrs. Douglas having offered the most, namely, one farthing per head for each contract, making an aggregate of one penny for all, the Committee recommended that their tender should be accepted, provided that they were able to satisfy the Committee as regards their sureties and their pecuniary ability to carry out the contract.

This report was approved by the Executive Committee, with the added conditions that the entrances of season ticket holders, and of railway and excursion ticket holders, and of all who paid at the doors, should be counted as against the contractor.

The conditions and forms of tender were framed on those of the London Exhibition of 1862, and required a bond, with two sureties to the amount of £250 each, for the due performance of his obligation by the contractor. The following were the principal clauses:—

Every tender to have annexed thereto a scale of charges in respect of the principal refreshments proposed to be served to the public by the person tendering. The tender for the first-class department must specify what refreshments will be supplied at a charge not exceeding 2s. and 3s., and for exhibitors and employes at 1s. 6d. per head, service included. The tender for the second-class department must specify what refreshments will be supplied at charges of 9d., 1s., and 2s., and for exhibitors and employes at 1s., service included; and that for the third-class department the prices at which refreshments, exclusive of dinners, will be supplied, service included.

Subject to certain conditions the Executive Committee will allow the contractor for the first-class department to keep open, after the close of the Exhibition each evening at 6 o'clock p.m., one or more dining rooms in the department.

Foreign wines and liqueurs will be exhibited and sold in connexion with the first and second-class refreshment department. The contractor shall specify on what terms of corkage, or otherwise, he will take charge of, open, and sell the wines and liqueurs of exhibitors delivered to him for that purpose by the committee.

Messrs. Douglas Brothers, the accepted contractors, carried out the arrangements with satisfaction to the public, and also, we believe, to the Executive Committee.

On the south side of the Concert Room, and running parallel with the entrance Hall is a passage, on the south side of which was situate the first class refreshment rooms. To the west of these, and approachable

from more than one convenient point, were well-arranged and numerous retiring-rooms and lavatories.

These, however, were not the only refreshment rooms; for on the north side of the Sculpture hall were second class refreshment rooms; and at the northern side of the annexe there was a third class refreshment room.

The porter pumps, which, owing to the distance of the casks from which the beverage was drawn, from the place of sale, were of a very powerful kind, as well as the spirit ranges; and the urns for heating tea, chocolate, and coffee, were made by the eminent firm of W. Curtis and Sons, of Dublin.

South-east of the first-class refreshment rooms there was a verandah smoking room, which was the terminal building at the south end.

Refreshment stalls were also placed in many of the stair-heads and recesses of the galleries.

The charges fixed with the contractors by the Executive Committee for various articles were as follows.

Tariffs of prices in the Refreshment rooms:—

	1st Class.	2nd Class.
	s. d.	s. d.
Fowl and Ham or Tongue, . . . . .	1 6	1 6
Galantine of Veal, . . . . .	1 0	0 9
French Pie, . . . . .	1 0	0 9
Pickled Salmon, . . . . .	1 6	1 0
Salmon Salad, . . . . .	1 6	1 0
Lobster Salad, . . . . .	1 6	1 6
Chicken Salad, . . . . .	1 6	1 6
Roast Lamb, . . . . .	2 0	1 6
Roast Beef or Mutton, . . . . .	1 3	0 9
Ham or Tongue, . . . . .	1 3	0 9
Sausage Rolls, . . . . .	0 4	0 3
Melton Mowbray Pie, . . . . .	1 9	1 6
Half ditto, . . . . .	1 0	0 9
Veal and Ham Pie, . . . . .	—	1 6
Half ditto, . . . . .	—	0 9
Fruit-Tarta, or Pastry, . . . . .	0 8	0 6
Mock-Turtle, or Ox-Tail, with Bread, . . . . .	1 0	0 10
Chicken and Ham, or Tongue, with Bread and Cheese, . . . . .	2 0	1 0
Ices, Cream or Water, . . . . .	0 6	0 4
Tea, Coffee, or Chocolate, per Cup, . . . . .	0 6	0 4
Ditto, with Roll, Bread and Butter, or Cake, . . . . .	0 8	0 6
Buns, each, . . . . .	0 2	0 2
Bath Buns, . . . . .	0 3	0 2
Beef or Ham Sandwich, . . . . .	0 6	0 4
Bread and cheese, . . . . .	0 8	0 6
Guinness's Stout and Allsopp's Pale Ale, per Glass, . . . . .	—	0 2
Ditto, per Bottle . . . . .	0 6	0 4
Soda Water, Lemonade, Ginger Beer, or Seltzer Water, . . . . .	0 6	0 4
Port or Sherry, per Glass, . . . . .	0 8	0 6
Whiskey or Gin, . . . . .	0 6	0 6
Brandy, . . . . .	0 10	0 8
Orange Brandy, . . . . .	0 10	0 8
„ Bitters, Milk Punch, or Cherry Brandy, . . . . .	0 6	0 6
All Liqueurs, . . . . .	0 9	0 8



## LIST OF FOREIGN WINES EXHIBITED.

Several varieties of foreign wine being exhibited, facilities were afforded for trying them in the Refreshment Department, where an extra stock was kept for the purpose. Those on sale embraced the following kinds:—

## A U S T R I A.

Name of Wine	Vintage	Name of Producer	Price in Place of Production	Price in Refreshment Room
			per Bottle s. d.	per Bottle s. d.
Dry Tokay, . . . . .	—	Count Henri Zichy, . . . . .	—	3 4
Essence of Tokay, . . . . .	1811	" . . . . .	—	20 0
Szegezarder, ( <i>Red</i> ) . . . . .	1855	Szegezarder Company, . . . . .	1 2	2 11
Somlayer, . . . . .	1858	Count Emanuel Zichy, . . . . .	—	3 0
Claret, Vöslauer, . . . . .	—	R. Schlumberger, . . . . .	—	2 6
" " Goldeck, . . . . .	—	" . . . . .	—	3 6
" " Cabinet, . . . . .	—	" . . . . .	—	4 0
Champagne, Blue Label, . . . . .	—	" . . . . .	—	4 2
" Red, " . . . . .	—	" . . . . .	—	5 2
" Green, " . . . . .	—	" . . . . .	—	5 10
Maraschino, . . . . .	—	Girolamo Luxardo, . . . . .	3 0	6 0

## F R A N C E.

Mercrey, . . . . .	1861	Union of French Wine Growers, . . . . .	1 3	2 8
Thorins, . . . . .	1858	" . . . . .	2 5	3 10
Savigny Beaune, . . . . .	1858	" . . . . .	2 3	3 8
" . . . . .	1859	" . . . . .	2 3	3 8
Beaune, . . . . .	1858	" . . . . .	2 8	4 0
Volnay, . . . . .	1859	" . . . . .	2 8	4 0
" . . . . .	1858	" . . . . .	3 7	5 0
Pommard, . . . . .	1858	" . . . . .	3 10	5 3
Aloxe Pouget, . . . . .	1859	" . . . . .	4 0	5 5
" Corton, . . . . .	1859	" . . . . .	5 7	7 0
St. George, . . . . .	1858	" . . . . .	3 7	5 0
Vosnes, . . . . .	1861	" . . . . .	2 7	4 0
Richebourg, . . . . .	1858	" . . . . .	4 10	6 3
Richebourg, . . . . .	1859	" . . . . .	4 5	5 10
Romanée, . . . . .	1859	" . . . . .	4 10	6 3
St. Jacques, . . . . .	1859	" . . . . .	4 5	5 10
Musigny, . . . . .	1859	" . . . . .	4 5	5 10
Chambertin, . . . . .	1857	" . . . . .	6 0	7 5
Clos Vougeot, . . . . .	1858	" . . . . .	6 0	7 5
Maçon Pouilly (white), . . . . .	1862	" . . . . .	1 3	2 8
Batard Montrachet, . . . . .	1862	" . . . . .	2 5	3 10
Vins Ordinaires, Beaujolais, . . . . .	1863	" . . . . .	0 7	1 6
" " . . . . .	1864	" . . . . .	0 6	1 3
" Beaune, . . . . .	1861	" . . . . .	1 0	2 0
" Côte Chalonnaise, . . . . .	1863	" . . . . .	0 11	1 9

## I T A L Y.

Grignolino, . . . . .	1861 and 1864	G. and L. Cora, . . . . .	—	2 3
Nebiole ( <i>Dry</i> ), . . . . .	1863	" . . . . .	—	2 3
" ( <i>Sweet</i> ), . . . . .	1863	" . . . . .	—	2 3
Tokay, . . . . .	—	" . . . . .	—	2 6
Barbera, . . . . .	—	" . . . . .	—	2 4
Vermouth, . . . . .	—	" . . . . .	—	2 10
Vermouth ( <i>with Quinine</i> ), . . . . .	—	" . . . . .	—	3 0
Vino Vermouth, . . . . .	—	G. B. Carpano, . . . . .	—	2 6
Lambrusco, . . . . .	1860 and 1863	Count Merenda, . . . . .	—	2 6
Vino Vermouth, . . . . .	1864	Baller and Co., . . . . .	—	2 6
Brollo, . . . . .	1863	Baron Ricasoli, . . . . .	—	2 5
Sicilian, . . . . .	—	Sub-committee of Catania, . . . . .	—	2 5
Marsala, . . . . .	1862 and 1863	Florio and Co., . . . . .	—	2 6
Liqueurs, Anisette, . . . . .	—	Count Merenda, . . . . .	—	2 0
" Curaçon, . . . . .	—	" . . . . .	—	2 0
" Chartreuse, . . . . .	—	" . . . . .	—	2 3
" " ( <i>White</i> ), . . . . .	—	Martini, Sola, and Co., . . . . .	—	2 0
" Alkermes, . . . . .	—	" . . . . .	—	2 0



the final closing for a limited period, not only to afford the working class an opportunity of visiting the Exhibition, but also for the purpose of enabling the exhibitors to dispose of their goods. It was accordingly determined to officially close the Exhibition on the afternoon of Thursday, the 9th of November, 1865, and public notice to that effect was given. The programme of the final closing having been determined on, the usual cards of invitation were issued for the ceremonial, which was to consist in the performance of a selection of music by the military bands of the Dublin garrison brigaded for the purpose, the reading of the Executive Committee's report, one or two addresses from distinguished speakers, and the final announcement of the closing of the Exhibition by Sir Bernard Burke, Ulster King-at-Arms, who kindly undertook the duty.

Not less numerous and enthusiastic than upon the opening day was the crowd of spectators who witnessed the closing ceremonial. But though there was loud applause and great satisfaction there was a mingled feeling of regret, such as suited the closing of a great undertaking. The 9th of May was bright, sunny, full of eager hopes and pleasant promises. The 9th of November was dark and dull, the light scarcely penetrated the central hall. There was no aspect of disappointment, but there was evident gloom; the cheers were as frequent, but not so loud as on the opening day, and even an orator distinguished for his humour confined himself for the most part to a serious discourse upon the benefits of Exhibitions. The throng was enormous; right up to the organ the orchestra was filled with spectators; the large central hall was dark and densely packed—bright dresses, gay ribbons, the stir and motion of a vast concourse were scarcely apparent; dark neutral tints and sombre shadows prevailed, but there was sufficient noise to prove the vitality of the assemblage. The pictures on the walls were chequered by alternate light and shade, and the strong black and white of the cartoons stood out in prominent relief. Through the fine stained glass window, on which was represented the last shot of adventurous Robin Hood, came faint gleams of blue and crimson, and the view of the transept from the orchestra was interrupted by the dark mass of spectators who filled the gallery. A few red flags fluttered, there was a sound of motion at the farther end of the hall as people passed in and out, but the *ensemble* was dreary, and as the shadows deepened the lights upon the ceiling grew gradually brighter. The several speakers were warmly received, but even a voice so clear and sonorous as that of Mr. Whiteside must have been over-tasked by the immense extent of the hall. The most cordial cheers were reserved for his Grace the Duke of Leinster, who spoke as distinctly and emphatically as one in the very prime of life, and whose few words produced the effect which the first peer and the truest patriot of Ireland can never fail to command. Altogether, the predominant feeling of the assemblage was that of gratitude to the promoters of the undertaking and the committee who had carried it out.

At one o'clock the bands of the 5th Dragoon Guards, the 8th (King's Own) Regiment, the 10th Hussars, 24th and 61st Regiments, arrived in the building and performed overtures until the hour for the ceremony struck.

Amongst those present upon the platform were:—

The Lord Mayor, the Lord Chancellor, the Archbishop of Dublin, W. Dargan, Sir Robert Shaw, W. C. Kyle, Captain L. E. Knox, Alderman Campbell, R. Gray, W. Kyle, F. W. Brady, Q.C.; J. Lentaigue, D.L.; Lord Earlsfort, Sir Wm. Wilde, Sir Bernard Burke, Mr. Dolaney, Mr. Gresham, Mr. Gregg, Mr. Fottrell, Dr. Nedley, Right Hon. Joseph Napier, Hon. Mr. Langdale, General Colomb, W. Lindsay, J.P.; Lord Otho Fitzgerald, J. Molloy, J.P.; Alderman Hudson, Sir Jocelyn Coghill, Bart.; Sir R. Barnwall, Lady Esmonde, Dr. Waller, Mr. Corballis, Sir R. Kane, C. Smith, Right Hon. James Whiteside, M.P.; James Hutton, Thomas Pim, Col. M. Taylor, Mr. Switzer, A. Parker, J.P., &c.

At three o'clock the chair was taken by his Grace the Duke of Leinster.

Mr. Charles E. Bagot, Secretary to the Executive Committee, read the following

#### REPORT OF THE EXECUTIVE COMMITTEE.

"At the close of the Exhibition it will probably be expected that some account should be given of its fortunes, and of the principal features which have marked its course. The statistics being still incomplete, and time not admitting of their careful analysis, a general summary, with approximate estimates of the results, is all that can now be presented. The enterprise, which has now reached its termination, had no pretensions to cope with the great Exhibitions of London and Paris. Its prototype, and that with which it may most legitimately be contrasted, is the Dargan Exhibition of 1853; and a brief comparison of some of their results will probably be interesting, and will give the best idea of the changes that have taken place in the interval in the commercial relations of the country, as well as in the scope and character of public exhibitions. The extent of space available in both was nearly equal, but it was very differently distributed; in 1853, the number of exhibitors in the British department was 1,566; in 1865 there were only 770. But on the other hand we have 1,544 foreign and colonial exhibitors, while only 288 appeared in 1853, and thus the total number of exhibitors shows a considerable excess over those of 1853. The committee were, in truth, obliged to exclude a great deal of raw produce (and of the coarser and less interesting class of manufactures) in order to make room for our foreign friends, and for the more attractive description of objects, of which a due proportion was, as experience had shown, essential to the success of an exhibition. In 1853 but one colony (besides India) and seven foreign countries were represented. This year twenty-one colonies, exclusive of India, and twenty-one foreign countries, have obtained space. The number of works of art exhibited in 1853 was 1,493, while this year they amounted to 2,072. Perhaps the sculpture has been regarded as the most striking and marked peculiarity of the fine arts department. It is unquestionably a very remarkable collection, in the number, interest, and value of the works in marble far exceeding that of 1853, and even that of Manchester in 1857, and indeed that in any previous Exhibition whatever. The Spanish and Scandinavian artists, whose works have deservedly attracted so much notice in these galleries, were wholly unrepresented in 1853, and the same observation applies to the instructive series of cartoons, as well as to the very numerous illustrations of the art of photography. We are not able to state at present with any precision the value of the contents of the Exhibition. At a rough estimate, the industrial objects may be set down at more than £400,000, and the fine arts at nearly £300,000, making a total value of £700,000. The Exhibition has been open for 159 days and 51 evenings, and the entire number of admissions of every kind has been a little over 900,000, being an average of about 5,000 by day and 3,000 by night. From the opening under the distinguished auspices of his Royal Highness the Prince of Wales, the favour of the public has for six months sustained the undertaking with a remarkably even tenor, the number of visitors rarely to any great extent rising above or falling below the average. It is true that we have had few adventitious aids to stimulate in any extraordinary degree the interest and curiosity respecting the Exhibition. For her Majesty's patronage, so graciously extended to us from the commencement, the Committee are most grateful, as well as for the presence on the opening day of their Royal Highnesses the Prince of Wales and the Duke of Cambridge. Nor should mention be omitted here of the kind support which the undertaking has always received from Earl Russell, her Majesty's Secretary for Foreign Affairs. But with these exceptions the visits of illustrious



of nations or individuals were scattered or divided, nothing that is great, useful, or brilliant would be attained. So much for the design of this Exhibition. As to its brilliant success look around you and judge whether it has been really successful. I feel our thanks are due not merely for the brilliant array of objects we behold; not for the marvellous paintings and beautiful sculpture collected within these walls are we to return thanks, but for the judgment, the ability, indefatigable energy, and courtesy which have marked the members of the Executive Committee from the first moment their labours began, until the present moment when they are now crowned with success. It would be impossible to conduct a great enterprise of this nature to a successful issue unless the men who undertook it were equal to the work. I remember his Grace the Duke of Leinster on a former occasion saying, in reference to this Exhibition, that it was begun and carried on, and it is now concluded by the unaided labour of Irishmen. As to the good which it is calculated to do our city, and the intellectual enjoyment it has afforded to thousands, these have been already referred to by the Lord Mayor in a comprehensive manner. Foreigners were induced to visit this beautiful country, and the secretary, Mr. Parkinson, has just reminded me of the fact, that no less than 700 tourists from Canada alone visited this country to examine and admire the beauties of your Exhibition. I am persuaded that the more they come to this country the better they will like it, for where will they find natural beauties of such a character—where will they find suburbs more deserving of a visit, not merely of a passing, but a prolonged visit! From the Sovereign down, we find persons visiting this country, and the only cause of regret is that they do not come sufficiently often. Although there may be some discontent in the country, they will find for the most part that the surface of society is not ruffled by passing circumstances, which may appear for a moment to interrupt our harmony and peace. The main point in view is the intellectual enjoyment which it has afforded to the masses, and for that we ought to thank those gentlemen of the Executive Committee. The lot of labour, the life of those devoted to labour is a rugged and severe life, and whatever can refresh, whatever can afford innocent pleasure to those engaged in labour (not very remunerative at times) ought to be fostered and encouraged. Therefore it is we ought to be grateful to this Executive Committee. To read a nation's history in its eyes has been said to be the glory of the statesman. To behold a people happy, peaceful, joyous, and contented, ought to be a source of satisfaction to the philanthropist and the Christian. Enjoyment has been given to the masses of our countrymen, and I venture to say no people in the world could show themselves by their conduct and courtesy more deserving of it. Therefore we may thank those gentlemen for having directed the tastes of the people to appreciate and admire objects of unparalleled worth and unspeakable beauty. But we have more for which to thank them; and that is, the singular stimulus they have given to art, industry, and inventive talent. Experience teaches, and example teaches, that if you bring before the tradesman a number of articles which he is in the habit of making or manufacturing, and he sees other men in other places have executed the work in a more artistic manner than he did, common sense and an idea of his own advantage and profit, as well as his future success in life, will prompt him to examine in what particulars others were superior to himself, and will induce him to imitate, and, if possible, to excel the works which others have executed. Independent of the mere works of hand, we must look at the galleries of art which contain those works of sculpture and those inimitable paintings, in which you find inscribed by the pencil of the artist the divine faculties of the soul. In the contemplation of those things we learn to appreciate the value of this splendid collection. When I lived in Rome, for two Winters of my life, I saw a man carrying a sack upon

his back lay it down and walk into the finest galleries in the world to admire and to criticise the great paintings there collected, and unrivalled throughout the earth, and walk away considerably improved by the contemplation. It was but the other night, as I passed through the sculpture gallery of this Exhibition, I saw an humble man, accompanied by his wife, for she seemed to be sufficiently attached to him, and I felt very much entertained at the art criticism which passed between them. Astonished by the variety and beauty of the figures, the woman said to him, "What is them?" He answered very happily, "Them is Venuses." He was astonished by the beauty and wonderful perfection of those statues, and he was unable to express his admiration in any other way than by comparing them to the most beautiful deities. Now, I like to see men of that class every night they have leisure and opportunity, enjoying in their native country those rational and intellectual treats; for the more they are felt and enjoyed, the more will we have peace and prosperity. I feel that this Exhibition will leave behind it very many happy memories, not merely from the recollection of the happy days and happy nights spent within its walls, but because it has promoted the sympathy which should always exist between class and class, and because it has shown that those who ought to feel for others have felt for them. It was a great work, which attracted a great multitude of foreigners to our shores, and I have no doubt it has laid the foundation for future enterprises, which may be equally successful. For those reasons we rejoice and sincerely and conscientiously say, that the men who did this work, and carried it to a successful issue, are true Irish patriots, not merely for what they said, but what they did, for believe me, true patriotism is as much to be distinguished by its calmness as its energy, and because turbulence and passion are incompatible with it. Therefore, the committee, who have carried out this work so successfully and so patriotically, it is for them, I venture, as a citizen of this great metropolis, to ask you to give them your heartfelt thanks, which is so eminently their due.

Mr. F. W. Brady, Q.C., said—I am deputed to acknowledge the thanks conveyed with so much cordiality by the Lord Mayor to the Executive Committee. It is no inconsiderable reward at the close of their labours to know that they have been thus appreciated. The task of the Executive Committee has been both arduous and anxious. They have felt at times encompassed by difficulties, escape from which appeared hopeless, and encountered by obstacles it seemed impossible to overcome. But they have been aided by a continually increasing amount of public encouragement and support, which has enabled them to bring the Exhibition to a prosperous termination. Following the example of her Majesty the Queen, nearly all the Sovereigns of Europe have assisted to further the Exhibition. Our records contain the names of upwards of 800 persons, exclusive of exhibitors, who in different parts of the world have promoted the undertaking. For all this aid the Committee have to express their warmest acknowledgements. The committee feel no small degree of pride in being able to announce that this undertaking—promoted and carried on altogether by Irish resources, and without pecuniary aid from any other quarter—has been to a large extent generally successful. They now resign the trust committed to them with the less regret, that these extensive halls are not to be taken away, but will soon be re-opened, and form a permanent centre of recreation and instruction where for years to come the people of Ireland may find many agreeable associations to recall the International Exhibition of 1865.

Sir Robert Kane, in moving a vote of thanks to the exhibitors, spoke very warmly of the kindness of the noblemen and gentlemen who had contributed statues and paintings to the galleries of the fine arts. He mentioned, amongst others, the Earl of Warwick, Lord Powerscourt, and Mr. H. Wood, who lent the collection

of pictures illustrative of the achievements for which the Victoria Cross had been conferred. He also paid a warm tribute of praise to the various manufacturers, both native and foreign, who had exhibited.

His Grace the Archbishop of Dublin, in seconding the resolution, said that the thanks should be especially addressed to those who had contributed to the Art collection, which was the pearl and crown of the Exhibition. These persons had lent treasures of art which were almost priceless, at no little hazard and danger. The rude Roman conqueror who had taken from Corinth the noble works of Phidias, Praxiteles, and Apelles, in committing them to the care of merchants for conveyance to Italy, cautioned the merchants that if any statues or paintings were broken or lost they should be replaced. But those who had generously lent the gems of their collection to that Exhibition knew that if lost or broken they could not be replaced, and yet they had willingly encountered the risk for the sake of serving the undertaking. What could replace, for instance, the splendid Spanish picture within his view of the Burial of St. Lawrence, or Story's statue of Judith, or that exquisite work, "The Sleeping Faun?" These works would soon be removed, but the impression which they left would remain. If a thing of beauty were a joy for ever, the fine arts treasures in the Exhibition about to close would never be forgotten, but would be remembered with a thankful sense of their beauty and their pure and ennobling influences.

The resolution was put and carried by acclamation.

Sir Bernard Burke then declared the Exhibition closed in these words.—On a previous occasion, by command of his Royal Highness the Prince of Wales, acting on behalf of her most gracious Majesty the Queen, I had the honour to announce the opening of this magnificent building. The Executive Committee has now requested me to perform another but a less agreeable duty, to declare that this great and brilliant Exhibition, which is one laurel more on the tomb of Prince Albert—is now at an end, with all its treasures, all its attractions, which, for the last six months, have so instructed and delighted us. In the name, then, of the Executive Committee, I declare the Dublin International Exhibition of 1865 CLOSED.

The Lord Mayor having been called to the second chair:—

The Right Hon. J. Napier moved a vote of thanks to His Grace the Duke of Leinster. They had not the advantage or the pleasure of Royalty or of their esteemed Viceroy, but they had Ireland's only Duke to preside, and this was but one of the many occasions on which he had shown his earnest desire to promote the welfare of Ireland. He had shed the mild light of his manly and genial nature upon that occasion, and his connexion with the Exhibition, now closing, would be remembered as one of his numerous efforts to improve the social condition and increase the influence of Ireland.

Sir Robert Shaw seconded the motion, which was carried by acclamation.

The Duke of Leinster, who was received with unanimous cheering, said—I thank you for the kind feeling which you have shown towards me. I assure you that you have amply repaid me for whatever part I have taken in the promotion of the Exhibition.

The orchestra, being then slowly cleared, was occupied by the bands of the five regiments; Mr. W. C. Levey took his place as conductor, and the grand triumphal march, which he composed for the occasion, was performed with singular unity and completeness. Mr. Levey is known as the son of an eminent Irish musician, and young as he is himself, holds no mean rank in the list of living composers. The march was composed upon two or three days' notice, but it contains ample evidence of his skill and taste. It is a massive, sonorous, and impressive piece. An agreeable use is made of the well-known airs, "Let Erin Remember," and "By that Lake whose Gloomy Shore," but the greater part of the music is original, and includes a very pleasant strain of melody. Under the direction of Herr Sauer, senior bandmaster of the garrison, the united bands then performed the 100th Psalm, "God Bless the Prince of Wales," and "God Save the Queen." The immense assemblage then slowly separated.

NOTE.—The Executive Committee, in order, if possible, to afford additional facilities to exhibitors for the sale, by auction or otherwise, of their goods, allowed visitors to be admitted to the building at a nominal charge during the fortnight subsequent to the official closing; but every care was taken that exhibitors should not be impeded in their arrangements for the packing up and removal of their property.

## BALL OF THE EXECUTIVE COMMITTEE.

THERE was a second ball held in the Exhibition Palace, which took place on the 10th of November, and was given by the Executive Committee, at the request of many persons of distinction that the "last scene of all" should be the "gayest;" and so in truth it turned out to be, under the supervision of the following distinguished ladies, who readily gave their patronage:—Marchioness of Ely, Lady Rachel Butler, Marchioness of Kildare, Countess of Meath, Countess of Granard, Countess of Charlemont, Lady Emily Peel, Viscountess Gormanstown, Viscountess Netterville, Viscountess Powerscourt, Viscountess Avonmore, Lady Talbot de

Malahide, Lady Lurgan, Lady Chelmsford, Lady Annally, Hon. Mrs. Preston, Hon. Mrs. Fitzgerald, Lady Hodson, Lady Brook, Lady Power, Lady Burke, Mrs. Taylor, Ardgillan Castle.

There was a large and fashionable attendance. The band of the 10th Hussars and Mr. Cassidy's string band kept up a spirited selection of music, and the dancing did not cease till an advanced hour. Messrs. Douglas, the refreshment contractors, supplied the supper, with the exception of the wines, the contract for which was given to the Messrs. Tabuteau, wine merchants, of Abbey-street.

CIRCULAR TO EXHIBITORS IN THE FINE  
ARTS DEPARTMENT.EXHIBITION PALACE, DUBLIN,  
November, 1865.

The Exhibition having now closed, the Executive Committee desire me to express to you their warm thanks for the liberality with which you so kindly placed at their disposal for so long a period works of so much interest and value, which contributed not a little to the attractions of the Exhibition.

The works are now ready to be returned to you, but before forwarding them the committee wish to bring under your notice the proposition of the Dublin Exhibition Palace and Winter Garden Company (to whom the Executive Committee are about to hand over these buildings) to maintain permanently in Dublin galleries for the display and sale of works of art of every description. It is optional, therefore, with you to leave your works, or a portion of them, here for such time as you may think proper. It is believed that many exhibitors will avail themselves of the advantages and facilities afforded by the company, and that a very excellent and pleasing collection will be formed, which will attract many visitors, and it is hoped may lead to the sale of many of the works.

Whenever you may require to have your property returned to you, the arrangements and conditions will be the same as if they were now forwarded.

You will be good enough to signify as soon as possible whether you prefer to have them sent back at once, or retained here.

I am, sir,

Your obedient servant,

C. E. BAGOT,  
Secretary Executive Committee.

We publish, in conclusion, the following correspondence:—

"Exhibition Palace, Dublin, 26th December, 1865.

"The Right Hon. the Lord Wodehouse,  
"Lord Lieutenant-General, &c., &c.

"My Lord,—The numerous works of art and other objects of interest which her Majesty the Queen graciously permitted to be displayed in the Dublin International Exhibition of 1865, having now been restored to the collections whence they came, the Executive

Committee direct me to request that your Excellency will be pleased to express on their behalf their humble and grateful acknowledgements of her Majesty's kind and condescending patronage of the Exhibition.

"It was not only that the magnificent works, thus spared for a time from the palaces of the Sovereign, contributed largely to the attractions and to the success of the Exhibition, by their intrinsic merits and beauties exciting the admiration of thousands who would otherwise have no opportunity of beholding them; but by the inhabitants of this city, and of Ireland generally, they were regarded with peculiar interest as evidences of her Majesty's desire to sanction and befriend every well-meant effort, however feeble and unpretending, to promote amongst the people of this country the love of the peaceful walks of industry, and a higher and more refined taste for art.—I have the honour to be, my lord, your Excellency's most obedient servant,

"(Signed) C. E. BAGOT,  
"Secretary, Executive Committee."

"Viceregal Lodge, January 6, 1866.

"Sir,—I am directed by the Lord Lieutenant to transmit to you the enclosed copy of a letter from Sir Charles Phipps, conveying the reply of her Majesty the Queen to a resolution passed by the Executive Committee of the Dublin International Exhibition.—I am, sir, your obedient servant,

"(Signed) EDMUND R. WODEHOUSE.  
"C. E. Bagot, Esq."

"Osborne, January 3, 1866.

"My Dear Lord Wodehouse,—I have had the honour to submit to Her Majesty the Queen your letter which I received yesterday, together with its enclosure from the Secretary of the Executive Committee of the Dublin International Exhibition.

"Her Majesty directs me to assure you, in reply, that she has been very much gratified to hear that the contributions which she willingly sent to the Exhibition have been considered to have conduced to the attractions and to the success of that undertaking.

"Upon this, as upon all other occasions, it is a pleasure to the Queen to be associated with any works which tend to the moral elevation, to the cultivation of industry and the arts, or to the happiness of her Irish people.—Believe me, &c., &c.

"(Signed) C. B. PHIPPS."

In enumerating those who were officially connected with the Exhibition, the following were omitted:—Mr. W. M'IVOR MORISON, Lithographer, Bachelors'-walk, Dublin, who designed and lithographed the external views of the Exhibition Palace, so extensively circulated both at home and abroad; FORSTER & Co., Crow-street, Dublin, Lithographers—this firm designed and executed the beautiful Certificate granted to those Exhibitors who received either a medal or the award of honourable mention; Mr. IVOR M'DONNELL, of Anglesea-street, Dublin, Printer, to whom was entrusted the important department of the preparation and printing of the countless bills, programmes, and posters, required from time to time during the progress of the Exhibition; Mr. J. GANNON, Builder, of Charlemont-street, Dublin, who carried out some important contracts to the entire satisfaction of the Building Committee, such as the extensive range of propagating houses in the Gardens, the orchestra in the small Concert Hall, &c.—he also fitted up a great number of the courts and cases for Exhibitors in the Foreign and Colonial Departments, prior to the opening of the Exhibition; and lastly, Mr. DILLON, of Great Britain-street, Dublin, who has reduced the posting of bills to a science, displayed the different announcements, &c., to the best advantage.

*Return showing the Temperature of the Building for each day during the duration of the Exhibition.*

MAY, 1865.							JULY, 1865.						
Week Day	Month Day	Temp. inside the Building			Temp. outside the Building	Rainfall Inches	Week Day	Month Day	Temp. inside the Building			Temp. outside the Building	Rainfall Inches
		Max. Ther.	Min. Ther.	Mean					Max. Ther.	Min. Ther.	Mean		
Tues.	9	59	46	52½	49	0.265	Satur.	1	74	54	64	64	
Wed.	10	56	47	51½	44		Mon.	3	72	60	66	65	
Thur.	11	56	46	51	47		Tues.	4	71	59	65	63	0.042
Fri.	12	54½	49½	52	45		Wed.	5	73	57	65	64	
Satur.	13	54	46	50	40		Thur.	6	70	59	64½	61	0.090
							Fri.	7	72	58	65	62	0.059
							Satur.	8	69	58	63½	60	0.387
Mon.	15	52½	47½	50	47½	0.072	Mon.	10	70	52	61	55	0.203
Tues.	16	54½	45½	50	49½		Tues.	11	71	50	60½	56	
Wed.	17	60	42	51	50½		Wed.	12	65	55	60	60	0.045
Thurs.	18	60	46	53	55		Thur.	13	69	55	62	62	
Fri.	19	50	50	55	56½		Fri.	14	67	59	63	64	0.188
Satur.	20	66	46	56	55½		Satur.	15	71	56	63½	64	
							Mon.	17	69	56	62½	60	
Mon.	22	68	50	59	59	0.094	Tues.	18	65	58	60½	57	0.212
Tues.	23	71	51	61	62		Wed.	19	65	57	61	59	0.322
Wed.	24	70½	49½	60	57½		Thur.	20	66	56	61	59	0.201
Thurs.	25	64	54	59	56		Fri.	21	66	57	61½	62	
Fri.	26	63	53	58	55		Satur.	22	68	58	63	62	
Satur.	27	64	50	57	57		Mon.	24	71	61	66	66	
							Tues.	25	70	62	66	65	
Mon.	29	63	55	57	57	0.922	Wed.	26	72	62	67	66	
Tues.	30	63	51	57	53		Thur.	27	74	58	66	60	
Wed.	31	65	49	57	53		Fri.	28	70	58	64	61	
							Satur.	29	72	56	64	59	0.023
							Mon.	31	68	52	60	53	0.101
JUNE, 1865.							AUGUST, 1865.						
Week Day	Month Day	Temp. inside the Building			Temp. outside the Building	Rainfall Inches	Week Day	Month Day	Temp. inside the Building			Temp. outside the Building	Rainfall Inches
		Max. Ther.	Min. Ther.	Mean					Max. Ther.	Min. Ther.	Mean		
Thur.	1	60	52	56	54	0.358	Tues.	1	67	51	59	55	0.144
Fri.	2	59½	52½	56	54		Wed.	2	63	49	56	51	0.027
Satur.	3	65	51	58	55		Thur.	3	69	47	58	55	
Mon.	5	70	54	62	66		Fri.	4	64	54	59	59½	0.011
Tues.	6	75	53	64	63		Satur.	5	63	57	60	61	0.059
Wed.	7	72	54	63	61½		Mon.	7	66	56	61	60	
Thur.	8	76	56	66	69		Tues.	8	67	57	62	60	
Fri.	9	73	59	66	64		Wed.	9	67	57	62	60	0.491
Satur.	10	74	56	65	60½		Thur.	10	66	58	62	59	1.361
							Fri.	11	70	54	62	59	0.019
Mon.	12	72	54	63	58		Satur.	12	65	54	59½	57	0.291
Tues.	13	72	50	61	60		Mon.	14	65	53	59	61	0.099
Wed.	14	71	53	62	61½		Tues.	15	65	53	59	58	0.569
Thur.	15	77	51	64	61		Wed.	16	65	53	59	59	0.025
Fri.	16	72	52	62	61		Thur.	17	67	51	59	55	
Satur.	17	76	52	64	64		Fri.	18	66	52	59	58½	
							Satur.	19	65	55	60	60½	0.187
Mon.	19	74	54	64	63		Mon.	21	67	57	62	61	
Tues.	20	78	54	66	68		Tues.	22	68	50	62	62	
Wed.	21	75	55	65	67		Wed.	23	64	58	61	59	0.210
Thur.	22	80	58	69	71		Thur.	24	68	56	62	61	0.239
Fri.	23	75	55	65	60		Fri.	25	70	54	62	61	
Satur.	24	71	57	64	60		Satur.	26	69	55	62	64	
							Mon.	28	71	53	62	56	
Mon.	26	71	59	65	65	0.496	Tues.	29	68	52	60	56	
Tues.	27	71	61	66	63		Wed.	30	64	58	61	58	
Wed.	28	71	59	65	63		Thur.	31	63	54	61	59	
Thur.	29	74	56	65	60								
Fri.	30	70	54	62	59								

Return showing the Temperature of the Building—continued.

SEPTEMBER, 1865.						
Week Day	Month Day	Temp. inside the Building			Temp. outside the Building	Rainfall Inches
		Max. Ther.	Min. Ther.	Mean	Mean	
Fri.	1	66	58	61	62	
Satur.	2	68	59	63½	65	
Mon.	4	69	59	64	63	
Tues.	5	69	58	63½	63	
Wed.	6	71	59	65	65	
Thur.	7	70	58	64	64	
Fri.	8	71	57	64	62	
Satur.	9	65	63	64	64	0·129
Mon.	11	69	61	65	66	
Tues.	12	72	60	66	66	
Wed.	13	70	60	65	62	
Thur.	14	71	57	64	62	
Fri.	15	71	57	64	68	
Satur.	16	75	55	65	62	
Mon.	18	72	52	62	60	
Tues.	19	71	55	63	62	
Wed.	20	70	50	60	55	·090
Thur.	21	65	49	57	54	
Fri.	22	69	49	59	55	
Satur.	23	66	45	57	56	
Mon.	25	66	52	59	60	
Tues.	26	67	52	59½	61	
Wed.	27	68	52	60	59	
Thur.	28	68	52	60	58	
Fri.	29	64	52	58	56	
Satur.	30	64	54	59	59	

NOVEMBER, 1865.						
Week Day	Month Day	Temp. inside the Building			Temp. outside the Building	Rainfall Inches
		Max. Ther.	Min. Ther.	Mean	Mean	
Wed.	1	50	39	44½	44	
Thur.	2	52	38	45	43	0·051
Fri.	3	43	39	43½	44	
Satur.	4	53	35	44	39	
Mon.	6	48	37	42½	41½	·043
Tues.	7	46½	33½	42½	42½	
Wed.	8	48	36	42	40	
Thur.	9	47	37	42	40½	
Fri.	10	45	38	42	42	
Satur.	11	46	40	43	45	
Mon.	13	47	43	45	46	
Tues.	14	54	35	45	44	
Wed.	15	48	39	48½	44	·065
Thur.	16	48	44	46	52	
Fri.	17	55	41	48	46	·140
Satur.	18	49½	42½	46	51	·109

This table was compiled from registers kept within and without the building, by Messrs. Chancellor and Sons, opticians, 55, Lower Sackville-street, Dublin. No observations were taken on Sundays. The highest temperature recorded is 80°, on the 22nd June. This was also the maximum degree of heat at the International Exhibition of 1862, in London, but it was there registered on the 5th May. The heat was greatest in the galleries of the Winter Garden Palace; and to modify this intense heat the Executive Committee had to place awnings over the whole of the glass roof in the interior. It will be seen from the table that rain fell only on 53 days out of the 168 days that the building was open to the public, and only on one occasion did the rainfall reach an inch.

OCTOBER, 1865.						
Mon.	2	64	56	60	61	
Tues.	3	65	55	60	60	
Wed.	4	67	51	59	59	
Thur.	5	66	50	58	58	
Fri.	6	64	49	56½	57	
Satur.	7	62	62	57	58	0·692
Mon.	9	62	54	58	57	
Tues.	10	64	52	58	56	·910
Wed.	11	63	53	58	54	
Thur.	12	58	52	55	50½	·696
Fri.	13	58	51	54½	51	
Satur.	14	60	48	54	51	·029
Mon.	16	59	46	54	52	·189
Tues.	17	58	47	52½	50½	
Wed.	18	58	44	51	45	·179
Thur.	19	56	46	48	42	
Fri.	20	52	36	44	42	
Satur.	21	52	36	44	42	
Mon.	23	45	43	45½	46	·136
Tues.	24	52	41	46½	49½	·190
Wed.	25	52	42	47	48	·2·9
Thur.	26	54	40	47	49	·191
Fri.	27	56	38	47	42	·429
Satur.	28	52	36	44	48	
Mon.	30	53	39	46	45	·064
Tues.	31	50	39	44½	43	·245

Registry of Admissions to the Exhibition.

Date 1865	Season Tickets	Paid at the Doors	Railway and Excursion Tickets	Free Passes
May 10,	332	271	114	not taken
" 11,	—	657	122	"
" 12,	1,333	312	76	553
" 13,	1,680	295	31	506
" 15,	1,362	348	19	836
" 16,	1,487	340	26	726
" 17,	794	270	27	604
" 18,	973	291	19	576
" 19,	1,250	413	38	581
" 20,	2,040	400	49	590
" 22,	1,204	382	29	623
" 23,	1,237	549	18	558
" 24,	1,331	807	7	481
" 25,	1,148	656	17	463
" 26,	1,162	703	17	521
" 27,	2,090	1,083	23	966
" 29,	730	569	22	909
" 30,	923	571	23	1,141
" 31,	2,913	1,322	97	1,183
June 1,	963	789	84	837
" 2,	2,095	987	121	1,110
" 3,	2,092	1,176	74	1,003
" 5,	951	2,945	20	987

Registry of Admissions to the Exhibition—continued.

Date 1885	Season Tickets	Paid at the Doors	Railway and Excursion Tickets	Free Passes	Date 1885	Season Tickets	Paid at the Doors	Railway and Excursion Tickets	Free Passes
June 6,	1,086	2,529	21	983	August 25,	676	2,330	125	1,029
" 7,	1,134	2,829	17	967	" 26,	545	1,899	188	1,028
" 8,	1,674	909	37	969	" 28,	485	3,356	181	1,126
" 9,	997	3,026	28	852	" 29,	460	2,498	95	986
" 10,	2,066	856	44	982	" 30,	577	2,430	92	1,064
" 12,	941	2,515	25	808	" 31,	360	2,378	348	1,121
" 13,	1,380	2,859	128	815	September 1,	587	2,255	251	1,055
" 14,	1,147	2,746	165	755	" 2,	490	1,755	138	992
" 15,	1,644	768	122	813	" 4,	513	2,956	151	1,166
" 16,	925	3,272	111	742	" 5,	242	2,250	252	979
" 17,	1,698	896	140	779	" 6,	527	2,330	197	1,025
" 19,	792	2,526	97	709	" 7,	366	2,293	348	1,015
" 20,	1,078	2,569	252	720	" 8,	546	2,215	219	1,008
" 21,	914	2,766	184	745	" 9,	593	1,941	456	1,159
" 22,	1,341	749	110	748	" 11,	484	3,054	126	1,177
" 23,	780	2,881	152	706	" 12,	578	2,525	221	985
" 24,	1,660	830	86	815	" 13,	537	2,626	230	983
" 25,	792	2,076	143	839	" 14,	362	2,811	261	1,022
" 27,	1,131	2,918	173	926	" 15,	522	2,156	149	1,012
" 28,	891	2,570	178	920	" 16,	643	1,706	1,166	1,043
" 29,	946	2,219	186	936	" 18,	439	2,916	252	1,139
" 30,	1,140	2,882	171	1,041	" 19,	930	3,159	501	996
July 1,	1,534	733	101	930	" 20,	674	2,754	575	989
" 3,	813	2,703	64	953	" 21,	939	3,303	968	1,016
" 4,	956	2,660	105	948	" 22,	1,022	2,968	856	996
" 5,	867	2,944	83	995	" 23,	524	2,071	279	975
" 6,	694	2,124	161	1,012	" 25,	487	2,704	306	1,169
" 7,	960	2,911	154	838	" 26,	473	2,832	776	964
" 8,	1,002	1,730	135	853	" 27,	584	3,149	581	1,026
" 10,	947	2,932	129	888	" 28,	487	3,163	532	1,042
" 11,	1,038	3,109	104	922	" 29,	478	2,034	1,348	1,002
" 12,	1,040	2,638	77	929	" 30,	538	1,565	401	1,008
" 13,	900	2,206	102	891	October 2,	468	2,183	952	1,281
" 14,	952	2,580	206	881	" 3,	984	2,516	373	1,185
" 15,	1,506	1,804	1,157	1,486	" 4,	977	2,432	170	997
" 17,	857	3,198	628	1,282	" 5,	831	2,664	590	1,034
" 18,	551	2,296	320	903	" 6,	835	2,065	592	978
" 19,	927	3,073	231	944	" 7,	584	1,549	287	987
" 20,	768	2,707	205	908	" 9,	489	1,989	1,261	1,070
" 21,	641	2,291	84	901	" 10,	564	2,066	1,304	940
" 22,	896	2,083	89	730	" 11,	496	1,716	233	990
" 24,	824	3,233	161	916	" 12,	472	1,975	204	997
" 25,	779	3,247	310	824	" 13,	1,070	2,063	953	1,052
" 26,	976	3,383	294	842	" 14,	1,085	1,876	433	1,096
" 27,	776	3,147	243	761	" 16,	358	1,446	401	1,079
" 28,	1,068	3,602	226	765	" 17,	582	2,077	2,155	923
" 29,	1,052	2,403	128	788	" 18,	531	1,762	1,122	966
" 31,	577	2,947	165	826	" 19,	554	2,151	1,078	898
August 1,	636	3,360	90	823	" 20,	726	1,943	1,102	891
" 2,	439	3,148	128	748	" 21,	699	1,474	513	1,431
" 3,	518	3,302	197	716	" 23,	366	1,731	1,454	1,021
" 4,	588	2,892	166	664	" 24,	428	1,926	2,395	876
" 5,	783	2,470	255	687	" 25,	720	1,870	1,602	901
" 7,	699	3,519	89	754	" 26,	482	1,642	760	864
" 8,	566	2,866	285	718	" 27,	749	1,622	797	874
" 9,	527	2,992	212	648	" 28,	719	1,597	276	926
" 10,	367	2,564	227	614	" 30,	591	1,910	498	1,106
" 11,	591	2,360	155	666	" 31,	577	1,423	610	894
" 12,	533	1,840	116	609	November 1,	760	4,466	5,188	942
" 14,	609	3,140	130	703	" 2,	513	1,667	1,091	890
" 15,	475	7,058	421	641	" 3,	993	2,042	304	904
" 16,	690	3,645	358	693	" 4,	733	1,772	491	1,165
" 17,	436	2,809	337	632	" 5,	741	3,340	1,573	1,113
" 18,	746	2,517	241	668	" 7,	923	3,532	738	1,053
" 19,	644	2,082	125	965	" 8,	1,100	3,348	1,129	1,241
" 21,	628	3,974	199	1,159					
" 22,	413	3,168	411	1,006					
" 23,	453	2,899	479	1,015					
" 24,	373	2,608	236	1,014	Closing Day, November 9,	2,067	5,810	1,866	1,291

## Registry of Admissions to the Exhibition—continued.

Date 1865	Season Tickets	Paid at the Doors	Railway and Excursion Tickets	Free Passes	First Evening open at 1s.				
					Date 1865	Season Tickets	Paid at the Doors	Railway and Excursion Tickets	Free Passes
Opened at 6d., November 10,	Season Tickets not available.	53	2	151	August 8,	877	2,245	62	221
" 11,		764	1	1,227	" 10,	686	2,478	148	218
" 18,		1,705	46	1,392	" 14,	577	1,595	36	176
" 14,		1,422	8	1,158	" 15,	631	2,956	80	185
" 15,		1,635	205	1,055	" 17,	917	3,706	257	194
" 16,		1,623	12	1,036	" 21,	412	1,289	52	304
" 17,		1,601	1	951	" 22,	709	3,211	154	295
" 18,		1,192	55	941	" 24,	710	3,160	254	331
" 20,		1,676	8	1,001	" 28,	437	1,435	78	289
" 21,		1,911	72	829	" 29,	635	2,308	74	318
" 22,		1,672	6	735	" 31,	895	2,882	160	305
" 23,		2,003	69	818	September 4,	451	1,601	87	285
" 24,		866	1	716	" 5,	533	2,054	92	281
" 25,		553	3	680	" 7,	704	2,743	272	472
Total,	134,773	373,517	61,310	155,358	" 11,	456	1,722	62	269
EVENINGS IN GARDENS.					" 12,	609	2,455	102	368
July 3,	940	858	—	—	" 14,	670	2,709	147	244
" 4,	386	174	—	—	" 18,	336	1,190	137	271
" 5,	468	320	—	—	" 19,	472	1,681	218	255
" 7,	374	192	—	—	" 21,	598	2,487	329	257
" 11,	389	259	—	—	" 23,	409	1,284	95	247
" 13,	434	334	—	—	" 26,	504	2,205	301	277
" 15,	656	570	—	—	" 28,	659	2,390	240	254
Grand Conversazione in the Building—Admission, 2s. 6d.					" 29,	449	1,507	262	261
July 21,	1,735	914	28	213	October 2,	1,803	1,335	14	422
Conversazione—Admission, 2s. 6d.					" 3,	595	1,488	97	264
August 1,	1,097	751	112	189	" 5,	699	2,377	117	271
" 3,	852	724	3	207	" 9,	452	1,310	160	277
Total,					" 10,	530	1,679	178	225
					" 12,	355	1,285	82	215
					" 16,	333	1,039	147	234
					" 17,	596	1,886	418	257
					" 19,	764	2,967	626	291
					" 23,	450	1,435	295	237
					" 24,	430	1,511	255	234
					" 26,	864	2,858	413	275
					" 30,	612	1,659	266	296
					" 31,	239	756	190	238
					November 1,	451	1,237	197	242
					" 2,	782	2,551	217	312
					" 3,	514	1,704	224	255
					" 6,	618	3,080	254	281
					" 7,	792	3,363	326	328
					" 8,	834	3,993	442	320
					" 9,	977	2,964	299	442
					Total,	35,007	100,776	9,059	13,102

Total number admitted, 882,902; in addition to this, the Agricultural Department, Kildare-street, was visited by 49,760 persons, making a grand total of 932,662 visitors to the Dublin International Exhibition of 1865.

The following are some of the Societies, Schools, &c., that visited the Exhibition at half price admission:—

**SOCIETIES**—Young Men's Christian Association, Trades of Dublin, Ancient Order of Foresters.

**SOLDIERS AND GARRISON SCHOOLS**.—Men and children of the Royal Artillery, of the 5th Dragoons, of the 10th Hussars, of the 11th Hussars, of the 8th Foot, of the 24th Foot, of the 61st Foot, of the 78th Highlanders, boys of the Royal Hibernian Military School, girls of the Drummond Institute. The Hibernian Military School and Drummond Institute, and all the children of the garrison schools were admitted free. These were the only exceptions to the general rule.

**SCHOOLS**.—Royal School, Portora; Mrs. Bell's Academy, Blue Coat Hospital School, School of Marine, Cabra School, Clondalkin School, Church Education

School, Dr. Spratt's Orphan School, Schools of the different parishes in the city, ragged and other charitable schools of the city.

**FIRMS WHICH SENT THEIR WORKPEOPLE**.—Messrs. Ross and Murray, Messrs. Turner, Messrs. Fry, Messrs. Pim Brothers, Messrs. Perry Brothers, Messrs. Findlater and Co., Messrs. Buckmaster and Co., M'Master and Co., Mr. Magill, Mr. Shaw, Celbridge; Messrs. Courtney and Stephens, Alliance Gas Company, Hibernian Company, Mr. Geo. Craddock, City Corporation, Mr. Keegan, Messrs. Rathborne, Messrs. Vincent and Co., Messrs. Guinness, Messrs. Cairns, Drogheda; Messrs. Todd and Co., Messrs. Scott and Co., Mr. Straffan, Mr. F. Lewis, Mr. Dawson, Messrs. Martin, Ballast Office, Mr. M'Gill, Mr. R. Mitchell, employees of the different railway companies.

The men of H. M. Fleet and all ships of war were also admitted at half price.

66,394 tickets were issued, of which 54,944 were excursion, school, and soldiers' tickets; 10,000 were to the society of trades, and 1,450 were day tickets.



## APPENDIX TO SECTION V. (MACHINERY).

CHATWOOD'S  
PATENT SAFE AND LOCK COMPANY  
(LIMITED),

LANCASHIRE SAFE AND LOCK WORKS, BOLTON.

Chatwood's Improved Patent Arrangements in Safes.

[First Prize Medal awarded for their Fire and Burglar Proof Safes and "Invincible" Locks; with Special Mention of the Wedge-proof Fastenings of S. Chatwood.]

In the Hardware Section of this work will be found an illustration and description of Chatwood's Patent Fire and Burglar Proof Safe. This safe being regarded, from its peculiar construction and manufacture, as rather an engineering production than an article of hardware manufacture (as safes have hitherto been regarded), it was decided, sometime after the Exhibition had been opened, to exhibit in the Engineering department specimens of parts of these safes in various stages of manufacture. For this purpose space was accordingly allotted in the Machinery Court. The specimens exhibited included the composite plates for the doors and sides of safes—the outer steel plate with the conical holes—section of the composite plate showing the hard metal in bar section—samples of the hard metal or "spiegel-eisen," used for the "intersection"—the sliding "claw bolts"—the T frame, with fixed claws to receive the sliding claw-bolts, and having also its curvilinear seating formed to fit the curvilinear edge of the door—and the gunpowder escapement valves; also a very beautiful model, made to scale, of the safe supplied to Mr. Walker after the notorious Cornhill robbery, and sectional drawings of the safe itself (Fig. 1 and Fig. 2). Referring to the engravings in the Hardware Section of this work (page 280), all these burglar proof arrangements will be seen as they appear in a finished safe, and in the sectional drawings on pages 559-60 they are shown more in detail, so as to illustrate more clearly their principle of action.

Before explaining the nature and object of these improvements, it may be well to state that the construction of locks has been already brought to such perfection as to have baffled all such old-fashioned resources of the burglar, as pick-locks, gunpowder, &c., and that the only agents now left at his command capable of destroying and penetrating a modern improved lock, are powerful acids applied to destroy the metal, or the oxy-hydrogen blow-pipe to fuse it. The blow-pipe has, however, been deprived of its power by the simple plan (secured under Mr. Chatwood's patents), of lining the key-hole passage of the lock with platinum or platinum alloy, and in coating or forming such parts of the lock as are accessible from the key-hole passage with platinum or platinum alloy; or by closing the key-hole passage by a screw or other plug, itself secured by means of a self contained lock or catch, carried in the plug itself, and coated or lined with platinum in all exposed parts. Destruction by acids is also prevented under Chatwood's patents, by making the component parts of the lock of electro-positive and electro-negative material, or by coating the parts of the lock with vitreous material. These various improvements have so completely secured the lock against all burglarious attempts, that burglars now seldom attempt to force the

lock of a safe, but invariably address themselves to the body or frame by means of a variety of ingeniously contrived tools and appliances, which no ordinary safe is capable of long resisting. "The art of burglary," says the *Engineer*, "has all but risen to the dignity of a science. The gentlemen of the pick-lock and the crow-bar manage their affairs with a skill, a forethought, and a consummate adroitness worthy a better cause." Indeed it may be said, that until lately the burglars have had matters pretty much their own way, having had all the engineering skill and science on their own side. The safes they have had to deal with appear to have been made simply to sell, rather than to comply with any principle of security. The principles of construction adopted by Mr. Chatwood, and secured under various patents, have, however, successfully and completely defeated the burglars on all points, and deprived them of all their resources, or rendered them useless in their hands. Thus, in the frame or casing, all possible applications of drills, circular cutters, or chisels, are rendered ineffective by means of the composite plate, in which the strong tough metal is so intersected by the hard brittle substance as to destroy at once the edge of any cutting tool brought to bear against it. The curvilinear edge of the door, and the seating against which it fits, prevents the insertion of the wedge, as it is manifestly impossible to make the wedge follow the curve, or to separate convex and concave surfaces when properly secured together; and as the wedge cannot be inserted, it follows that no opening can be made to afford a hold or purchase for the crow-bar. The peculiar form of the "sliding claw-bolts" prevents the possibility of their being forced back by driving a screw through the side of the safe, endways against the end of the bolt, and affords also an additional security against the action of the wedge. Lastly, gunpowder is rendered powerless by simply connecting the outer part of the door with the lock case by screws supported on strong spiral springs, which, when subjected to any excess of pressure from the explosion of gunpowder, will yield sufficiently to allow a slight opening of the outer part of the door for the instant, sufficient to allow the gases generated by the explosion to escape. By these various arrangements the amount of forcing power that it is possible to bring to bear upon the safe is reduced to an almost nominal figure, while the holding power is enormously increased. A safe constructed on these principles will successfully resist all the skill and ingenuity of the burglar, assisted by all his most improved apparatus, exerted during a period of forty-eight hours without interruption.

We may fairly congratulate Mr. Chatwood on having succeeded in demonstrating to the world that by the application of correct engineering principles defence is

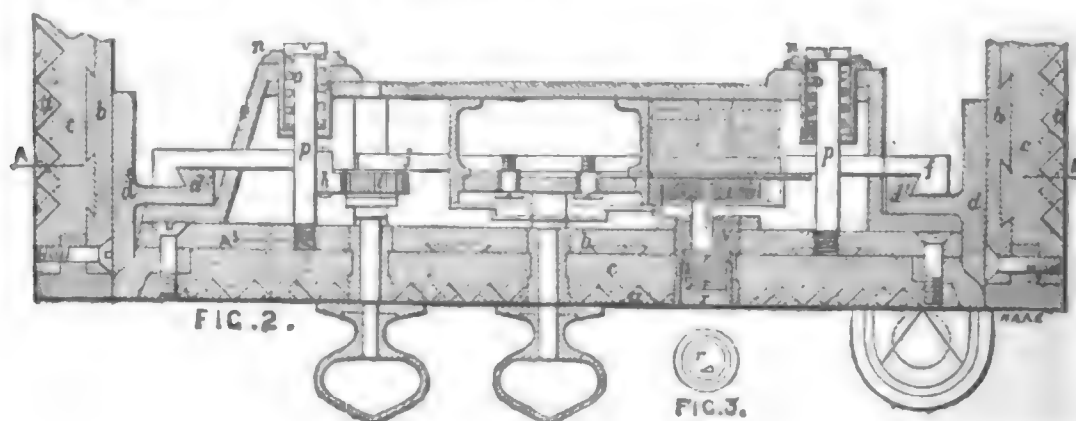


Figure 2 is a section through A, A, Figure 1; *a, a, a*, outer ductile steel plates with conical holes; *b, b, b*, inner steel plates; *c, c, c*, "intersecting crystalline steel;" *d, d*, T-frame with projecting dovetail rib *d'* for reception of "sliding claw bolts," *f, f*; *e, e*, frame of lock case; *i*, pinion for actuating the sliding claw bolts; *j*, bolts of eccentric cam lock; *k*, eccentric cam lock; *l*, the small lock throwing bolt *l'* into the periphery of eccentric cam lock and small bolt *l''* into the spindle of eccentric cam lock or (if no fixed spindle is used) over the keyhole of the same; *n, n*, cups or spring boxes into which fit spiral springs, *o, o*, under the head of the

screws *p*, which fasten the lock case to the door A 3; *q*, steel keyhole boss with "platinum" keyhole plug lock, *r*, inserted and secured by the self-contained bolt *r* 1, which shoots into the slot *r* 2 of the boss *q*.

Figure 3 is a plan of boss *q* of figure 2 and plug *r*, lock inserted. The edges of the door are of the "curvilinear" form, fitting into a "curvilinear" seated in frame of safe, thus rendering wedges inoperative.

Detailed views, showing the parts of the composite plate forming the frame and door of the safe, are given at page 281.



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(Class D—Sect. 21, No. 6. See p. 278.)

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### CHARLES CUMMINS,

Accountant, for Ten Years, to the Dublin, Wicklow, and Wexford Railway Company;  
Accountant to the Royal Dublin Society's Exhibition, 1864;  
Late Accountant, Exhibition Palace Company, &c. &c.

### HENRY PARKINSON,

Secretary to Committee, Royal Dublin Society's Exhibition, 1861;  
Late Secretary of the Exhibition Palace Company, and Secretary and Controller of  
the Dublin International Exhibition, 1865.



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